

Homeland Emergency Response Exchange (HERE)

(Previously known as: Heartland Emergency Response Exchange)

Flow Implementation Guide

Final Version

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Introduction

Purpose

This document provides high-level instructions on how to begin sharing program data with the Homeland Emergency Response Exchange. This guide assumes familiarity with Exchange Network and the existence of a production Node in place at the organization.

Note: this guide is not intended for *users* of the HERE Client, i.e., the emergency personnel that want to have access to the data; but rather it is intended for organizations that wish to make their data available to emergency personnel.

Background

The four states in EPA Region VII created the Homeland Emergency Response Exchange (HERE) to provide available environmental, health, and natural resource information to state agencies involved in homeland security / emergency response planning and implementation. This exchange provides facility data as well as other environmental information among multiple partners, including five agencies in Iowa, Kansas, Missouri, and Nebraska. The resulting data is used to enhance decision-making and risk assessment for Homeland Security and/or Emergency Response situations occurring within or across state boundaries.

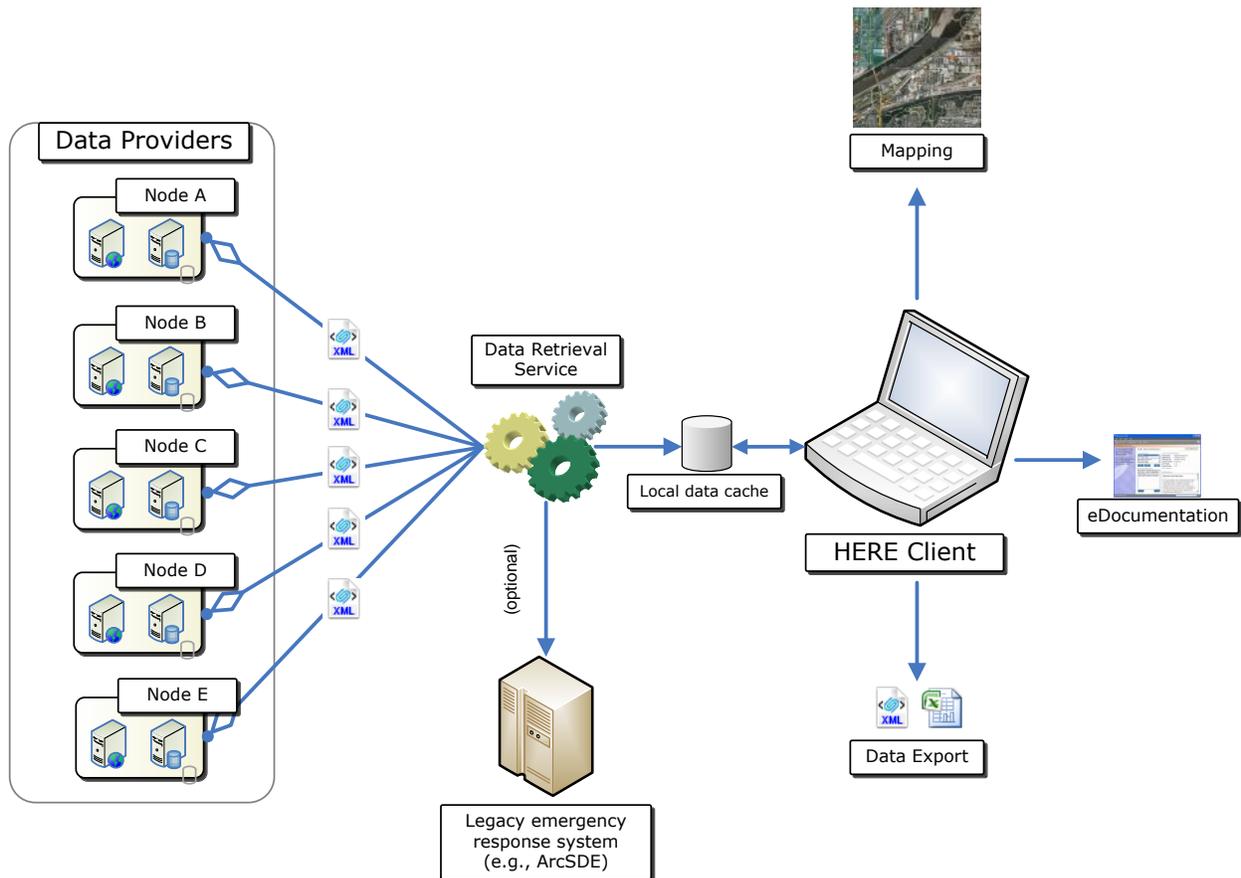


Figure 1: Homeland Emergency Response Exchange Overview

The primary users of HERE are state emergency planning agencies and U.S. EPA. Secondary users of the exchange may be other state agencies, other federal agencies, local emergency planners, and others involved in homeland security/emergency response planning. While the exchange began in EPA Region VII, it is intended to be extended to any Exchange Network partners who wish to publish their data so it can be shared with emergency personnel.

The exchange is supported by a client-based approach to retrieving and displaying data. In this approach, partners regularly publish XML files to a Node for later retrieval by multiple client machines. The retrieval process runs in the background at a time configured by the user. This service can then either store the data directly in the HERE Client's own local data cache or can be sent to an external database (e.g., ArcSDE). This method ensures that data is kept current within the client systems with minimal effort required on the part of the Nodes of the various partners.

Please refer to the HERE Project fact sheet for more context on the project as a whole, available here: <http://www.exchangenetwork.net/exchanges/cross/HEREFactSheet.pdf>

HERE Implementation Tasks

Preparatory Tasks

The following tasks should be performed to understand the implications of joining the HERE Network, and evaluate your organization's readiness to participate.

Review HERE Client Training Materials

The first step is to become acquainted with the HERE Exchange. This can best be achieved by reviewing the documentation and demonstrations available on the HERE web site, www.HereNetwork.org, as well as the more technical materials found at the Exchange Network project web site, www.exchangenetwork.net/exchanges/cross/here.htm.

Within these materials, you will find the contact details of the current HERE participants. It would be valuable to contact them to discuss your interest in implementing the HERE Exchange.

Evaluate Dataset Readiness

Currently, there are four types of data that the HERE exchange supports:

- **HERE Facility:** Contains site, geographic location, environmental interest, and contact information.
- **HERE Chemical Storage:** Contains information on chemicals stored at the site, collected per Emergency Planning and Community Right to Know Act (EPCRA) reporting requirements.
- **HERE Livestock:** Contains information on livestock managed by the site, submitted per National Pollutant Discharge Elimination System (NPDES) reporting requirements.
- **HERE Public Water Supply:** Contains information such as water type and population served, collected per Safe Drinking Water Act reporting requirements.

It may be the case that your organization is unable to provide all of these due to the lack of data availability or data system stability. The only dataset that is required to join the HERE Exchange is HERE Facility, but the additional datasets contain valuable additional information for the emergency responders as well. Further details of the four data sets can be found in the HERE Flow Configuration Guide as well as additional resources for each of the four associated XML schema that can be found on the Exchange Network web site.

Evaluate Node Readiness

The HERE Exchange is a “publishing” type of data exchange that breaks the mold of traditional two partner data exchanges. The requirements of emergency responders include certain characteristics that necessitate capabilities not typically supported by current Nodes. For example, the data must be available during a potential network blackout and yet must also support a potentially large volume of data and its recipients. The data exchange recipient is likely to be using a personal computer, which may or may not be of high-performance. Furthermore, much of the data is of a sensitive nature, and therefore must only be accessible to authorized end users. The design of the HERE Exchange includes some advanced

techniques that are able to support these requirements. The HERE Client is already able to support these requirements, and HERE provisioning Nodes must have the following capabilities:

- Able to fully support Exchange Network 1.1. Specification and Protocols
- Able to support Query and Download for NAAS authenticated requests that originate from any location (e.g., no firewall filtering)
- Able to generate and compress incremental XML documents using data queries on a predefined schedule
- Able to store and retrieve previously generated documents using Transaction Id
- Able to validate user NAAS access policies per Exchange (flow) for Query and Download
- Able to manage the operating organization's NAAS accounts and policies

Implementation Tasks

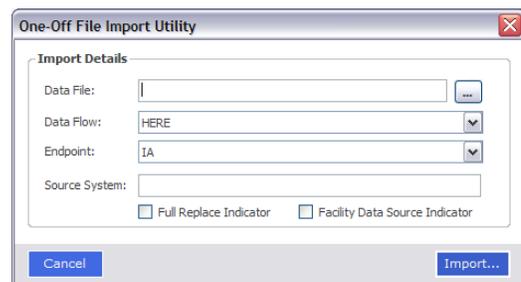
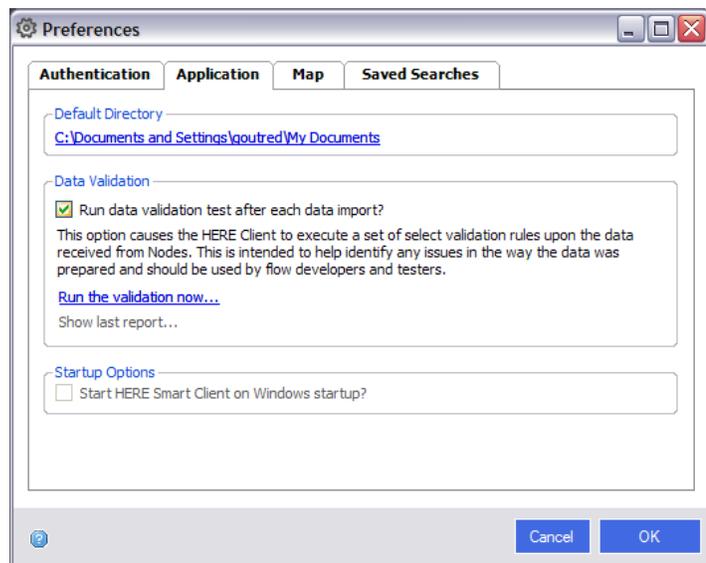
Once the scope of the work required to implement the HERE Exchange is known, the implementation work can begin. It is recommended that development is achieved in two phases. First, creating sample XML files and testing their correctness. Second, implementing the Node flow of these payloads to the Client.

Develop data mappings and XML generation logic

For each of the datasets to be implemented, a traditional database-schema mapping exercise is needed to be able to create sample XML files from the source system(s). How this is achieved is greatly dependent upon the Node and Flow architecture employed and is not detailed here. If a common Node architecture is used, then it may be possible to reuse flow source code from another agency.

Once valid XML files have been generated, then the HERE Client can be employed to help provide a further verification of the data format and content. Note: some the XML files (e.g., for CAFO or SDWIS) reference look up code values that may need to be "registered" in the HERE Client. This is achieved by providing these codes within a domain values XML file, as described in the FCD. Please also refer to the sample domain list XML file which contains example values.

With the HERE Client downloaded and installed on a Windows PC, one can configure it to execute a limited set of data validation rules against the data being loaded. This is achieved by checking the *'Run data validation test after each data import'* box in the Client's Preferences settings. The sample XML file can then be manually loaded into the Client by using the Tools>Data Import>Data Exchange



XML File options from the Client menus. This emulates the process the Client performs when it receives a file via the exchange network – please refer to the FCD for the details of the fields requested. For the Endpoint pick an existing surrogate agency for testing purposes until your flow has been tested and your node is then registered in the Client by the HERE Steward.

If the file is well formed, it will be processed and the data will become visible in the Client. A thorough review of the data should be performed using the Client data access capabilities to ensure that the data has been correctly processed. There is every chance that unforeseen issues will occur during the multi-step process of data extraction and transformation, incremental data change processing, XML formulation, flow transmission, XML de-serialization, and finally, data loading into the Client's data store. Therefore, it is beneficial to first validate the XML file before adding the further steps of EN transmission.

If the XML file loading fails, then the Client Application Log should be examined to see the error messages contained. This is available from the Help>Application Log menu in the Client.

If the file loads successfully, and the *'Run data validation test after each data import'* setting has been set, then the validation report will display. The report contains a list of tests, and the color of the flag next to each test indicates if there have been any errors, warnings, or a successful test. For errors and warnings, clicking on the flag will provide further details of the data issues.



Implement HERE services

The HERE flow requires an untraditional set of services to be implemented, as defined in the FCD. These services use an approach that assumes incremental XML files are generated and stored in the Node document repository so that they can be provided to the many recipient emergency responders that will use the HERE Client, thus minimizing the amount of data that needs to be transferred on a regular basis. Although this process may require more up-front processing than a traditional flow, the requirements are fully compatible with the current Exchange Network Specifications and Protocols and should result in less processing overhead overall when serving the HERE Clients.

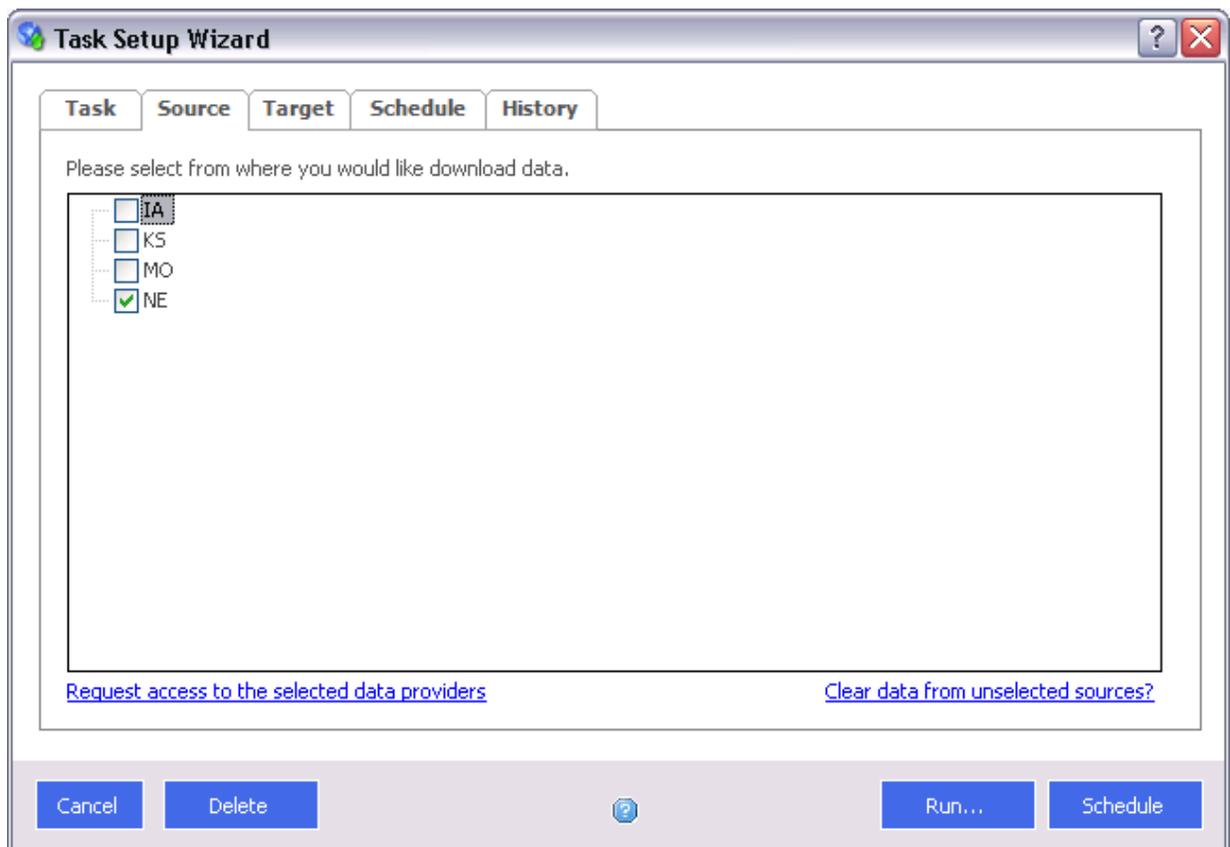
Test HERE Flow

Once the HERE services have been installed on the Node, testing should be performed using a generic Node client to ensure that the basic operation is correct. Once that has been achieved, then the HERE Client should be used to test the complete flow process.

First the Client will need to be configured to recognize the Node. Until a central registration server is implemented (e.g., ENDS), this is achieved by inserting a record into the Client's local SQL Server Express database (see the example insert statement depicted on the right)¹.

```
INSERT INTO App_Endpoint
(EndpointName
,EndpointUrl
,EndpointAdmin
,EndpointStateCode)
VALUES
('NE'
,'https://deqnode.ne.gov/service'
,'dennis.burling@ndeq.state.ne.us'
,'NE')
```

The data exchange can be initiated by clicking on the Data Download task on the HERE Client dashboard, ensuring that the node is selected in the Target tab and clicking the Run button. The exchange



process will begin within one minute. Once complete, the Application Log can be reviewed for technical issues. If there are none, the data validation report should again be reviewed for any errors.

¹ Note: this same approach can be used to change an existing production node to target the test version of that same node so that changes to the data exchange can be tested prior to release to production.

Register HERE Flow

With the HERE Flow installed and tested, the flow should be released your production Node. The HERE Steward will then be able to register the new Node with the HERE Client, and the Client automatic update process will disseminate the new Node to each of the installed Clients.

As emergency responders request access to your Node's HERE data, you will receive emails to the EndPointAdmin email address you specified above requesting that access. If you wish to give them access, you will need to provide that flow level access through NAAS and they will begin receiving data updates from your Node.