



National Capital Region Interoperability Program

NCR CAD to CAD Data Exchange Functional Requirements

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**Prepared by the NCR Interoperability Program
Data Exchange Hub Project**



NCR Interoperability Program (NCRIP)

NCR CAD to CAD Data Exchange Functional Requirements

Revision History

Date	Description	Authorized by
6/25/2007	Original format, not deliverable, but presented in Technical Meeting #1 and commented upon.	Chris Wiseman
7/25/2007	Revised format, deliverable markup. Expanded functional requirements for discussion and finalization in Technical Meeting #2	Chris Wiseman
8/20/2007	Revised requirement master sections (not vendor specific) based on CAD to CAD "to be" process flows. Specific vendor functional requirements addressing the specific screens in vendor systems will be created separately.	Chris Wiseman
10/10/2007	Incorporations for security requirements, scaling concerns, and auditing/integrity challenges.	Chris Wiseman (with inputs from Greg Crider and Scott Scheurich)
10/15/2007	Lynn's comments incorporated.	Chris Wiseman
10/30/2007	Revisions post final pre-vendor meetings with Arlington, Alexandria, and Fairfax FDs.	Chris Wiseman
6/30/2008	Revisions with final consideration of technical requirements. Message changes in section 2.3.	Chris Wiseman
4/17/2009	Revisions with consideration to local incident id and remote incident id in unit status messages.	Chris Wiseman
5/10/2009	Final revisions from adding considerations above, other clarifications, for a final distribution to vendors.	Chris Wiseman
9/21/2009	Additional and modified requirements based on early integration testing with vendors and stakeholder concerns – specifically override functions.	Chris Wiseman



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1 Background and Purpose

This document captures the Phase I functional requirements to implement Northern Virginia (NOVA) CAD-to-CAD Interoperability Data Exchanges between Fairfax County, Arlington County, and the City of Alexandria - signatories of the Northern Virginia (NOVA) Emergency Services Mutual Response Memorandum of Agreement.

The basis for these functional requirements is the *Northern Virginia (NOVA) Fire Dispatch Computer Aided Dispatch System Interface Requirements* document dated January 2007, authored and issued with inputs from the representative jurisdictions. The interface requirements enumerated desired functionality as follows:

- Real-Time Status Changes
- Dispatched Incident Forwarding
- Pending Incident Display
- Secondary Dispatch
- Dispatch Confirmations
- Status Keeping
- Automatic Vehicle Location
- Administrative Functions
- Interoperability Notification

Functionality will be implemented following a phased approach. Plans in the Project Charter executed between the three participants indicate the following functions will be implemented in Phase I of this project:

- Real-Time Unit Status Updates
- Request for Resource with Incident Information

Ultimately, the functionality delivered in Phase I of the project may adjust as a result of funding and priorities (TBD).



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2 CAD to CAD Data Exchange Functional Requirements

The Functional Requirements below were created after reviewing the interface description document authored by the Communication Center managers and information collected during site visits to participating PSAP centers. The functional requirements have been grouped into these distinct areas:

- DEH Infrastructure – Requirements on the Integration Backbone
- Vendor Systems – Requirements on the Vendor Systems and Implementations
- Messages – Requirements on the messages

2.1 DEH Infrastructure

The DEH Infrastructure satisfies core, operational objectives critical to the CAD to CAD Data Exchange Interoperability – to establish an integration backbone including messaging, transformation services, workflow orchestration, and system adapters to connect CAD Systems.

Table 1. DEH Infrastructure Functional Requirements

RQMT ID	Functional REQUIREMENT
Architecture	
FR-DEHI-1	The DEH Infrastructure shall be the integration backbone between all CAD Systems integrated into the CAD to CAD Data Exchange.
FR-DEHI-2	The DEH Infrastructure shall be designed and deployed to provide high availability, fault tolerance, and service and capability redundancy for regional systems. The architectural technical requirements will define the system architecture.
Inter-System Communications	
FR-DEHI-3	All communications in the CAD to CAD Data Exchange shall occur between CAD Systems and the DEH Infrastructure. The DEH Infrastructure will serve as the message broker between all participating CAD Systems. No direct CAD System to CAD System interoperable communications will occur.
FR-DEHI-4	The DEH Infrastructure shall publish a WS-I compliant, web services messaging interface to communicate with CAD Systems. WSI-compliant Web Services are the preferred interface for promoting and upholding a wider integration standard. The DEH Infrastructure will publish and consume web services to facilitate the functional requirements of the CAD to CAD Data Exchange. Web Services will allow the design to be system agnostic and to leverage many WS-* features for reliable messaging, addressing, security, policy and other features built into the specifications.



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RQMT ID	Functional REQUIREMENT
FR-DEHI-5	The DEH Infrastructure shall support synchronous and asynchronous web service request/response communications with the CAD Systems.
Inter-System Security	
FR-DEHI-6	<p>The DEH Infrastructure shall use the HTTP/S protocol for communications with the CAD Systems.</p> <p>Initial testing and integration strategies will be permitted without encryption on the web services and consumed messages.</p>
FR-DEHI-7	The DEH Infrastructure shall install an X.509 certificate representing the DEH Infrastructure for messages from the DEH Infrastructure to Vendor Systems.
FR-DEHI-8	The DEH Infrastructure shall accept an X.509 certificate representing the Vendor Systems for messages from the Vendor systems to the DEH Infrastructure.
Inter-System Time Synchronization	
FR-DEHI-9	<p>The DEH Infrastructure servers shall all synchronize with an authoritative time source accessible to DEH servers and CAD System servers.</p> <p>A requirement to have CAD Systems time synch from the same authoritative time source will be beneficial for auditing and metrics on message throughput and transaction auditing.</p>
Services / Capabilities	
FR-DEHI-10	<p>The DEH Infrastructure shall provide message content based routing capabilities to the CAD to CAD Data Exchange.</p> <p>Content based routing services inspect messages issued to the DEH Infrastructure and route the messages to the proper processes and endpoint CAD Systems based on the content of the message. For example, if the Fairfax CAD System issued a Request for Resource with Incident Information message to the system which contained units from Arlington and Alexandria, the DEH Infrastructure content based routing services would get that message to Arlington and to Alexandria. If the Request for Resource with Incident Information message only contained units from Arlington, there would be no need for that message to be issued to the Alexandria system. The DEH Infrastructure will use content based routing services to manage proper message distribution.</p>
FR-DEHI-11	<p>The DEH Infrastructure shall provide message filtering capabilities to the CAD to CAD Data Exchange.</p> <p>Message filtering services will be applied in situations where a CAD System only needs to receive certain filtered information. For example, in the Unit Status Report Response messages returned to CAD Systems, a CAD System need not receive Unit Status for units that belong to its jurisdiction and are managed by local CAD Systems to update status. That jurisdiction only needs to receive Unit Status for units in the CAD System belonging to other jurisdictions.</p>



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RQMT ID	Functional REQUIREMENT
FR-DEHI-12	<p>The DEH Infrastructure shall maintain message filtering rules and configurations for CAD Systems in the CAD to CAD Data Exchange.</p> <p>The DEH Infrastructure will catalog data rules such that it will recognize units pertinent to or belonging to a particular jurisdiction and filter messages accordingly.</p> <p>For example, Fairfax reports status and issues a unit status report message to the DEH Infrastructure. The DEH Infrastructure recognizes it is a Fairfax report and responds with a unit status report response to the Fairfax CAD System which only contains master status for non-Fairfax units, i.e. Arlington and Alexandria units. The Fairfax CAD System will update the status of the Arlington and Alexandria units in its system from the unit status report response message.</p>
FR-DEHI-13	<p>The DEH Infrastructure shall provide data transformation and data mapping capabilities to the CAD to CAD Data Exchange.</p> <p>Data transformation and data mapping capabilities will be applied where the format and/or data element representations of the same data need to be adjusted between CAD Systems. For example,</p>
FR-DEHI-14	<p>The DEH Infrastructure shall maintain data transformation and data mapping rules and configurations for CAD Systems in the CAD to CAD Data Exchange.</p>
FR-DEHI-15	<p>The DEH Infrastructure shall orchestrate the message transaction process between CAD Systems.</p> <p>Business process orchestration and state management of a transaction between CAD Systems, such as request and response fulfillment of Request for Resources with Incident Information involving multiple systems will be fully managed by the DEH Infrastructure.</p>
FR-DEHI-16	<p>The DEH Infrastructure shall provide logging and auditing capabilities to the CAD to CAD Data Exchange.</p> <p>Logging capabilities include logging to console (if applicable), log files, and database for analysis, metrics, and reporting. Auditing will allow verification of messages send/receipt/processing, etc.</p>
FR-DEHI-17	<p>The DEH Infrastructure shall provide error handling capabilities to the CAD to CAD Data Exchange.</p> <p>Error handling capabilities including message and communication retry and other defined actions will be handled within the DEH Infrastructure.</p> <p>The level to which the DEH will handle errors and the appropriate actions beyond notification will be codified in the technical requirements.</p>
FR-DEHI-18	<p>The DEH Infrastructure shall provide notification capabilities to the CAD to CAD Data Exchange.</p> <p>At a minimum, notification capabilities including email and email based paging will be handled within the DEH Infrastructure.</p> <p>The level to which the DEH will notify must be codified in the technical requirements.</p>



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2.2 Vendor Systems

The Vendor System functional requirements describe the architectural, inter-system communications, and general functional implementation requirements a vendor CAD System must implement to participate and interoperate in the CAD to CAD Data Exchange.

Vendor Systems must be modified to issue messages on implemented functions such as dispatching units to an incident or modifying/changing units assigned to a dispatched incident. In addition, vendor systems must implement functionality to create pending dispatches and respond to the DEH Infrastructure when a remote jurisdiction requests units. Response messages to resource requests must account for all units requested from the local jurisdiction (some available, some not perhaps). The local jurisdiction CAD System that made the request for mutual aid resources needs to be able to handle the response, notify the dispatcher/operator that all units were not available and allow unit adjustments/assignments and re-issuing of messages accordingly if new units are remote units.

Table 2. Vendor Systems Functional Requirements

RQMT ID	Functional REQUIREMENT
Architecture	
FR-VS-1	Vendor systems shall implement a communication architecture that provides a high-availability interface to communication with the DEH Infrastructure.
Inter-System Communications	
FR-VS-2	Vendor systems shall publish a WS-I compliant web services messaging interface to communicate with the DEH Infrastructure. As defined in the System Interface requirements with the respect to the DEH, a WSI-compliant web services interface to support functionality is the preferred integration interface.
FR-VS-3	Vendor systems shall support synchronous web service request/response and unsolicited request communications with the DEH Infrastructure. The vendor functional implementation will need to account for an unsolicited message from the DEH that may impact a current incident and units assigned, etc. Synchronous messaging is self-explanatory in that the response the vendor system waits for and receives will dictate the resulting functional action. In an unsolicited message situation, the vendor system may receive a message without an initiating request. This could be manifested as an unsolicited Request for Resource with Incident Information message (response-type) if units previously available with the synchronous response are not available at time of dispatch or a Request for Resource with Incident Information Cancel message from a vendor system that previously requested mutual aid
Inter-System Security	
FR-VS-4	Vendor systems shall use the HTTP/S protocol for communications with the DEH Infrastructure. Initial testing and integration strategies will be permitted without encryption on the web services and consumed messages.



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RQMT ID	Functional REQUIREMENT
FR-VS-5	Vendor Systems shall install an X.509 certificate representing the CAD System for messages from the Vendor Systems to the DEH Infrastructure.
FR-VS-6	Vendor Systems shall accept an X.509 certificate representing the DEH Infrastructure for messages from the DEH Infrastructure to the Vendor Systems.
Inter-System Time Synchronization	
FR-VS-7	<p>The Vendor system servers shall all synchronize with an authoritative time source accessible to DEH servers and CAD System servers.</p> <p>A requirement to have DEH Infrastructure systems time synch from the same authoritative time source will be beneficial for auditing and metrics on message throughput and transaction auditing.</p>
General Functional Implementation (generic to all vendors)	
Request for Resource with Incident Information Request	
FR-VS-8	<p>Vendor systems shall consume a DEH published web service to issue a Request for Resource with Incident Information message to the DEH Infrastructure on the implemented communication interface when a dispatch is performed (unless an override is active, see below and in vendor specific functional requirements).</p> <p>Only a primary requesting CAD System dispatch incident initiation should issue a message to the DEH Infrastructure requesting units. The remote mutual aid CAD System(s), upon receiving the Request for Resource with Incident Information message, will create pending dispatches in their system(s); however, these pending dispatches should be tagged or marked so as not to issue a Request for Resource with Incident Information message when the new incident is dispatched. The secondary, receiving, or mutual aid CAD Systems will however issue a synchronous response message (see below).</p> <p>A dispatch is defined as an action where units will roll. For example, when a CAD System operator creates an incident, assigns recommended units, and locally in their system dispatches that event (units will roll as a result of that action), the CAD System will issue a message representing that incident and units as a Request for Resource with Incident Information to the DEH Infrastructure.</p> <p>The specific screen names in each jurisdictional CAD System will be defined in the vendor specific functional requirements.</p> <p>The schema and data element usage in the request messages will be defined in the technical requirements.</p>



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RQMT ID	Functional REQUIREMENT
FR-VS-9	<p>Vendor systems shall consume a DEH published web service to issue a Request for Resource with Incident Information message to the DEH Infrastructure on the implemented communication interface when a dispatch incident associated units are modified/changed (unless an override is active, see below, see below and in vendor specific functional requirements).</p> <p>For example, the status or severity level of an incident that has been dispatched is determined to be much more severe than originally thought. If a dispatch incident has units added to it, a Request for Resource with Incident Information message must be issued to the DEH Infrastructure. The DEH Infrastructure will determine if other CAD Systems units are involved and issue the appropriate communications to the other CAD Systems. The result is those CAD Systems adjust the incident if it exists in their system or they create the incident to be able to assign and dispatch their unit.</p> <p>The schema and data element usage in the request messages will be defined in the technical requirements.</p>
FR-VS-10	<p>Requirement FR-VS-10 has been rescinded. Vendor systems should always attempt to consume the DEH Infrastructure RequestForResource web service operation and send R2I2 Request messages.</p> <p>Override features are critical to the end users and will be managed at the exchange level. In lieu of placing override requirements on vendors, the end users desire the vendors to handle some additional RequestForResource Response unit status values in addition to ASSIGNED and REJECTED. It is desirable to provide messages indicating the response disposition to the dispatchers/operators, but ultimately, the additional statuses are nothing more than different flavors or REJECTED which is already being handled. The new values provide less ambiguity in the response. The values are outlined and described in the Technical Requirement 2.6.8.</p> <p>Vendor systems shall provide an incident level override which will prohibit the CAD System from sending a Request for Resource with Incident Information message to the DEH Infrastructure (will not consume the DEH web service) when a dispatch is performed or a dispatched incident is modified/changed.</p> <p>An incident level override only applies to a particular incident. Other incidents dispatched will still result in messages being sent to the DEH Infrastructure.</p>



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RQMT ID	Functional REQUIREMENT
FR-VS-11	<p>Requirement FR-VS-11 has been rescinded. Vendor systems should always attempt to consume the DEH Infrastructure RequestForResource web service operation and send R2I2 Request messages.</p> <p>Override features are critical to the end users and will be managed at the exchange level. In lieu of placing override requirements on vendors, the end users desire the vendors to handle some additional RequestForResource Response unit status values in addition to ASSIGNED and REJECTED. It is desirable to provide messages indicating the response disposition to the dispatchers/operators, but ultimately, the additional statuses are nothing more than different flavors or REJECTED which is already being handled. The new values provide less ambiguity in the response. The values are outlined and described in the Technical Requirement 2.6.8.</p> <p>Vendor systems shall provide a system level override which will prohibit the CAD System from sending a Request for Resource with Incident Information message to the DEH Infrastructure (will not consume the DEH web service) when any dispatch is performed or any dispatched incident is modified/changed.</p> <p>A system level override applies to all incidents. No messages are issued to the DEH Infrastructure for dispatched incidents or dispatched incident modifications/changes while a sending system level override is enabled.</p> <p>This requirement has been specifically requested to account for and manually manage large, regionally applicable situations like the 9-11 incidents. Departments would be working closely, but will find it necessary to strictly manage their own resources in these situations.</p>
FR-VS-12	<p>Requirement FR-VS-12 has been rescinded. Vendor systems should always attempt to consume the DEH Infrastructure RequestForResource web service operation and send R2I2 Request messages.</p> <p>Override features are critical to the end users and will be managed at the exchange level. In lieu of placing override requirements on vendors, the end users desire the vendors to handle some additional RequestForResource Response unit status values in addition to ASSIGNED and REJECTED. It is desirable to provide messages indicating the response disposition to the dispatchers/operators, but ultimately, the additional statuses are nothing more than different flavors or REJECTED which is already being handled. The new values provide less ambiguity in the response. The values are outlined and described in the Technical Requirement 2.6.8.</p> <p>Vendor systems shall provide a system level override which will prohibit the CAD System from processing a Request for Resource with Incident Information message from the DEH Infrastructure when another participating CAD System requests resources.</p> <p>No messages will be processed from the DEH Infrastructure for mutual aid while a receiving system level override is enabled.</p> <p>This requirement has been specifically requested to account for and manually manage large, regionally applicable situations like the 9-11 incidents. Departments would be working closely, but will find it necessary to strictly manage their own resources in these situations.</p>



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RQMT ID	Functional REQUIREMENT
FR-VS-13	<p>Vendor systems shall notify dispatchers or operators if units dispatched to incidents are not updated by a certain time since dispatch or last modification.</p> <p>This functionality is generally already implemented within the CAD Systems to aid operators tracking dispatch events/incidents.</p> <p>For example, a CAD System dispatches units to an incident. This dispatch involves local units in its jurisdiction and units from another jurisdiction providing mutual aid. The local units will presumably update their status via their MCTs, MDBs, or mobile communication links to the local CAD System. The remote jurisdiction mutual aid units are not coupled to the local CAD System to update their status with respect to the incident. The local CAD System must notify the local CAD System dispatcher/operator if a period of time expires and unit status has not been updated where appropriate, e.g. from “DISPATCHED” to “EN ROUTE.” A status change to “EN ROUTE,” for example, would indicate the unit has responded. It is possible that the local CAD System operator might make this status change manually when the remote mutual aid unit communicates with the local dispatcher/operator via radio.</p> <p>This requirement is tied to elicit discussion about issuing messages to the DEH when units are removed from an incident or in the case when an incident with assigned units is modified (units added, etc.). In the present ConOps in the NOVA Mutual Aid agreement, if a jurisdiction requires mutual aid units from another jurisdiction, they assign them to the incident and dispatch the incident locally in their own CAD System before the mutual aid units are confirmed available. In the full-interoperability mode, the local dispatcher will assign recommended units, perform the dispatch, and the Request for Resource with Incident Information message will be issued to the DEH. The receiving mutual aid CAD System will process the request and potentially reject the request because a unit is not available (no pre-reservation). The synchronous response will be handled and routed back to the requesting CAD System. The requesting CAD System will need to handle the Request for Resource with Incident Information Response and alert the operator – spurring a recall or a function to assign other units, etc.</p> <p>Mutual aid units will have their statuses adjusted in all participating systems accordingly. However, if the unit was a mutual aid unit, the DEH status cache will not get updated from the local CAD System managing that mutual aid unit. Only CAD System local units having a local status change will be updated in the DEH status cache. Communication channels must reconcile these.</p> <p>Status changes will be reflected in the Unit Status Update messages when units are ASSIGNED (held, pending), DISPATCHED (EN ROUTE, ON SCENE, etc.), and when incidents are closed out and units are again de-encumbered and made AVAILABLE for another incident.</p> <p>Technical requirements will attempt to exhaustively outline all interactions and communications.</p>
FR-VS-14	<p>Vendor systems receiving a Request for Resource with Incident Information message from the DEH Infrastructure (DEH consumes a CAD System web service) shall create a pending dispatch incident provided at least one of the local units requested in the message is available and can be assigned to the incident.</p> <p>The CAD System dispatcher will be responsible for reviewing the pending dispatch and physically performing the dispatch action to roll the units locally in the supplying mutual aid jurisdiction.</p>



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RQMT ID	Functional REQUIREMENT
FR-VS-15	<p>Vendor systems requested to supply mutual aid (receiving a Request for Resource with Incident Information request from the DEH) shall issue a Request for Resource with Incident Information Response message to the DEH Infrastructure immediately upon receiving a Request for Resource with Incident Information message. This is a synchronous response to the Request for Resource with Incident Information request.</p> <p>The Vendor system supplying the Request for Resource response must wrap back the incident information, provide a disposition status of ASSIGNED or REJECTED for each unit that was requested in the CAD System, update the Submitter Metadata to reflect the jurisdiction sending the response, and utilize the message sequence number in the Request for Resource response that is supplied in the Request for Resource request. Thus, if three units were requested of a mutual aid jurisdiction and only two of the three were available and could be assigned to the incident, those two unit response statuses would indicate "ASSIGNED" and the third unit response status would indicate "REJECTED".</p> <p>The schema and data element usage in the response messages will be defined in the technical requirements, particularly with respect to the response disposition status of the units requested.</p>
FR-VS-16	<p>Vendor Systems requested to supply mutual aid (having previously received a Request for Resource with Incident Information request from the DEH) shall consume the DEH Infrastructure RequestForResourceUpdate operation and issue an unsolicited Request for Resource with Incident Information Response message to the DEH Infrastructure if a unit previously assigned to an incident is not available at the time the incident is being dispatched. This is an unsolicited Request for Resource with Incident Information response message. The RequestForResourceUpdate web service operation is a one-way operation and does not issue a response message.</p> <p>A unit may have been available when the incident was created, but might not be available by the time the incident is being dispatched. This scenario must create an exception that the remote, requesting CAD System must handle when it receives this unsolicited response message through the RequestForResourceUpdate operation.</p>
FR-VS-17	<p>Vendor Systems requesting Mutual Aid which receive a Request for Resource with Incident Information response message from the DEH Infrastructure with pertinent incident identifier shall modify the pertinent dispatch incident and alert the dispatcher/operator if some or all of the remote jurisdiction mutual aid units were not available to be assigned and dispatched to the incident.</p> <p>The RequestForResource Response message unit statuses that will be returned to the requesting jurisdiction will include the following statuses :</p> <ol style="list-style-type: none"> 1. ASSIGNED: This status is marked by the remote jurisdiction which would supply the mutual aid units. This unit status response indicates the remote jurisdiction unit was available to be dispatched when the remote CAD system received the RequestForResource Request message. See FR-VS-16 above. 2. REJECTED: This status is marked by the remote jurisdiction which would supply the mutual aid units. This unit status response indicates the remote jurisdiction unit was NOT available to be dispatched when the remote CAD system received the RequestForResource Request message.



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RQMT ID	Functional REQUIREMENT
	<p>3. TIMEOUT: This status is marked by the DEH Infrastructure. This unit status response indicates the remote jurisdiction asked to supply mutual aid units was contacted by the DEH and the request for mutual aid was received but the DEH did not receive a response in a reasonable amount of time.</p> <p>4. UNREACHABLE: This status is marked by the DEH Infrastructure. This unit status response indicates the remote jurisdiction asked to supply mutual aid units could not be contacted by the DEH and the request for mutual aid could not be forwarded at all to the remote jurisdiction.</p> <p>5. OVERRIDE: This status is marked by the DEH Infrastructure. This unit status response indicates the remote jurisdiction asked to supply mutual aid units is in an override state and is not supplying mutual aid to other jurisdictions participating in the exchange at this time.</p> <p>Local CAD System functional implementation to recommend next available units will take over here and until the modification/change is made to add units, a new Request for Resource with Incident Information message will not be issued to the DEH Infrastructure.</p> <p>An example of this implementation is as follows: A jurisdiction creates a dispatch event involving mutual aid units from another jurisdiction. The mutual aid jurisdiction CAD System supplying mutual aid units receives the request which includes single or multiple units in its local unit complement to assign to an incident. The mutual aid jurisdiction CAD System must create the dispatch incident and assign the units that were available. All units, regardless of whether they were available and ASSIGNED or unavailable and REJECTED and could not be assigned, must be dispositioned and noted in the synchronous Request for Resource with Incident Information response message to the DEH. This response will be aggregated by the DEH with any other outstanding requests to other jurisdictions and the overall response for all units is returned to the original requesting jurisdiction CAD System.</p> <p>The jurisdiction CAD System originating the Request for Resources must be able to interpret the unit statuses in the RequestForResource Response message and notify the operator/dispatcher, either through visual and/or audible mechanisms/alerts, if all mutual aid units requested or initially assigned to the incident were not able to be assigned when the request was received by the other remote jurisdiction(s) (noted in the response message). The implementation of how a specific CAD System will alert its operators/dispatchers is left to vendor implementation. However, a message or alert providing operators/dispatchers distinction between REJECTED, TIMEOUT, UNREACHABLE, and OVERRIDE is essential.</p>
FR-VS-18	<p>Vendor systems shall modify incident/event entry screens as necessary or modify database tables as necessary to account for new and/or pertinent interoperability information including:</p> <ul style="list-style-type: none"> - Requesting CAD System Incident Number (correlative and reporting purposes) - Radio Channel for Communication - Remote CAD System Incident ID - LOI (Location of Interest) Information (if supplied)



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Request for Resource with Incident Information Cancellation (FUTURE PHASE)	
	<u>Request for Resource with Incident Information Cancellation will be implemented in a future phase and will not be required in the initial phase of this interoperability.</u>
FR-VS-19	<p>Vendor systems receiving a Request for Resource with Incident Information Cancellation message from the DEH Infrastructure shall perform a cancellation action on the specified active incident and de-encumber the assigned units.</p> <p>Perhaps the implementation notifies the dispatcher/operator of the cancellation request and they perform the action to close the incident and de-encumber the units manually. This is left up to vendor implementation.</p>
Unit Status Update	
FR-VS-20	<p>Vendor Systems shall consume a DEH published web service to periodically issue a Unit Status Update message.</p> <p>The Unit Status Update message will be issued on a periodic basis. The period to issue this message will be configurable in the Vendor System. This ought to be able to be adjusted for tuning purposes. The Unit Status Update message ought to be able to be issued at least every 1 second by the CAD System. Nominal issuing period is projected to be about every 3-5 seconds.</p> <p>The Unit Status Update message will contain a CAD System identifier to indicate which CAD System issued the report. In addition, the unit status update will contain a unit identifier and corresponding unit status for each unit in the reporting CAD System.</p> <p>The schema and data element usage in the Unit Status Update message will be defined in the technical requirements.</p>



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FR-VS-20-1	<p>Vendor systems shall reflect the local dispatch status of a unit in local and remote incidents in the Unit Status Update message.</p> <p>The Unit Status Update message contains data elements for a local incident identifier and a remote incident identifier for each unit contained in the message. The CAD System issuing unit status(es) shall apply the following business rules to populate the local incident identifier and the remote incident identifier data elements:</p> <ol style="list-style-type: none"> 1. If a unit is dispatched to a local incident, the unit status data will include the local incident identifier. 2. If a unit is dispatched to a local incident which was created by a request for mutual aid (an incoming Request for Resource with Incident Information message), the unit status data will include both the local incident identifier and the remote incident identifier. <p>The business rules above do not make the distinction as to whether a unit is considered local (owned and managed by the local CAD System) or whether a unit is considered remote for mutual aid purposes (owned and managed by a remote CAD System). However, when publishing unit status, the local CAD System will always have the local incident identifier if the unit is dispatched and it should have the remote incident identifier. The remote incident identifier would have been received in the Request for Resource with Incident Information message which resulted in the local incident being created.</p>
FR-VS-20-2	<p>Vendor systems shall use the local incident identifier and remote incident identifier information supplied in the unit status update message response to reconcile unit status(es) against the local incidents in the CAD System.</p>
FR-VS-21	<p>Vendor systems shall be able to receive and process a Unit Status Update response.</p> <p>The Unit Status Update response will be returned synchronously to the vendor CAD System, by the DEH Infrastructure, as a response to the Unit Status Update request (from the CAD System).</p> <p>The Unit Status Update response will contain the CAD System identifier to indicate which CAD System issued the update (it should match). In addition, the Unit Status Update response will contain a unit identifier, unit status, and the local and remote incident identifiers, if applicable, for each unit in the reporting CAD System that is not owned or managed by the CAD System's local jurisdiction.</p> <p>The DEH Infrastructure will recognize the CAD System issuing the Unit Status Update, filter, and process the status for units local to that CAD System jurisdiction. The DEH Infrastructure master status cache will be updated with new status for units owned or managed by the submitting CAD System. The DEH Infrastructure will respond synchronously to the submitting CAD System with the most current master cache status for units in remote jurisdictions only. The CAD System will process this response and update the unit status for the units it receives in the response. Thus, units that are not locally owned by the CAD System jurisdiction will be updated on each response to the CAD System.</p>
Interoperability Notification (FUTURE PHASE)	
<u>Interoperability Notification will be implemented in a future phase and will not be required in the initial phase of this interoperability.</u>	



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FR-VS-23	<p>Vendor systems shall issue an Interoperability Notification message to be broadcast or distributed as general information to the other participating CAD Systems.</p> <p>This type of notification will be issued at least one time under at least the following conditions:</p> <ol style="list-style-type: none">1. A CAD System disables the Unit Status Update function (Periodic unit status update messages will not be issued to the DEH).2. A CAD System enables the system level override for the Request for Resource with Incident Information function (RRII messages will not be issued to the DEH on dispatch).
FR-VS-24	<p>Vendor systems, upon receiving an Interoperability Notification message, shall take steps to update message logs, status logs, and visibly and audibly notify the operators that a change in the interoperability participation has occurred.</p>



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2.3 Messages

The Messages functional requirements describe the types of messages, message data elements, and general requirements pertaining to the CAD to CAD Data Exchange messages.

Table 3. Messages Functional Requirements

RQMT ID	Functional REQUIREMENT
Message Format	
FR-M-1	Messages shall consist of well-formed XML.
FR-M-2	<p>Messages shall conform to the Law Enforcement IT Standards Council (LEITSC) CAD RMS IEPD message structures designed for law enforcement CAD, RMS, and Alert interoperability which include message types and data elements pertinent to Fire & EMS interoperability as well.</p> <p>These LEITSC message schemas may be extended by the DEH to account for full capability where required.</p>
Request for Resource with Incident Information Request Message	
FR-M-3	<p>A Request for Resource with Incident Information Request message shall contain at least the following data elements:</p> <ul style="list-style-type: none"> - Parent element identifying Request for Resource with Incident Information Request - Requested Action (CFS) - Requesting CAD System Identifier - Requesting CAD System Incident Number - Timestamp CAD System creates / sends message - Event Location/Address - Event Type/Code - Fire Box/Grid #(s) - Radio Channel for Communication - Unit #(s) / Unit Identifiers for all units assigned to the incident in the requesting CAD System. - Location of Interest (LOI) info – building on fire; hazmat info; asbestos info; fire pump system out of service –send extra units - Supplement (comment description) <p>The specific elements used to pass these data items will be outlined in the technical requirements.</p>
Request for Resource with Incident Information Response Message	



NCR Interoperability Program (NCRIP)

NCR CAD to CAD Data Exchange Functional Requirements

RQMT ID	Functional REQUIREMENT
FR-M-4	<p>A Request for Resource with Incident Information Response message shall contain all data elements in the Request for Resource with Incident Information Request message and:</p> <ul style="list-style-type: none"> - Parent element identifying Request for Resource with Incident Information - Requested Action (CFS Response) - Timestamp DEH Infrastructure creates / sends response message - Unit assignment status (assigned/rejected/etc.) for each unit requested in the mutual aid CAD System <p>The Request for Resource with Incident Information Response Message uses the same schema as the Request for Resource with Incident Information Request Message.</p> <p>The specific elements used to pass these data items will be outlined in the technical requirements.</p>
Request for Resource with Incident Information Cancellation Message (<u>FUTURE PHASE</u>)	
<u>Request for Resource with Incident Information Cancellation will be implemented in a future phase and will not be required in the initial phase of this interoperability.</u>	
FR-M-5	<p>A Request for Resource with Incident Information Cancellation message shall be represented by a Request for Resource with Incident Information message and adhere to:</p> <ul style="list-style-type: none"> - Parent element identifying Request for Resource with Incident Information - Requested Action (CANCEL) - Timestamp CAD System creates / sends message
Unit Status Update Message	
FR-M-6	<p>A Unit Status Update message shall contain the following data elements in the request from the requesting CAD System:</p> <ul style="list-style-type: none"> - Parent element identifying Unit Status Update - Requesting CAD System identifier - Timestamp CAD System creates / sends request <p>and for each unit in the requesting CAD System, a status containing:</p> <ul style="list-style-type: none"> - Unit # / Unit Identifier - Unit Status Code (native to CAD System issuing the report) - Unit Local Incident Identifier (unit is assigned to a local incident) - Unit Remote Incident Identifier (unit is assigned to a correlated remote incident)
Unit Status Update Response Message	



NCR Interoperability Program (NCRIP)

NCR CAD to CAD Data Exchange Functional Requirements

RQMT ID	Functional REQUIREMENT
FR-M-7	<p>A Unit Status Update Response message shall contain the following data elements returned in the response to the requesting CAD System:</p> <ul style="list-style-type: none"> - Parent element identifying Unit Status Update - Requesting CAD System identifier - Timestamp DEH Infrastructure creates / sends response <p>and for each unit in the response to the requesting CAD System, a status containing:</p> <ul style="list-style-type: none"> - Unit # / Unit Identifier - Unit Status Code (native to CAD System to receive the response) - Unit Local Incident Identifier (unit is assigned to a local incident) - Unit Remote Incident Identifier (unit is assigned to a correlated remote incident)
Interoperability Notification Message (FUTURE PHASE)	
<u>Interoperability Notification will be implemented in a future phase and will not be required in the initial phase of this interoperability.</u>	
FR-M-8	<p>An Interoperability Notification message shall contain the following data elements to broadcast to other participating CAD System:</p> <ul style="list-style-type: none"> - Parent element identifying Interoperability Notification - Issuing CAD System identifier - Timestamp DEH Infrastructure creates / sends response message - Notification Message - Notification Level