



Section 3— Data Exchange Functional Design Guidelines

APRIL 2011



ADMINISTRATIVE OFFICE
OF THE COURTS

INFORMATION SERVICES DIVISION

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1.0 Key Design Guidelines

The following principles shape the functional design and implementation of CCMS data exchanges:

- Reusability and scalability are key design requirements.
- Leverage the Integrated Services Backbone (ISB) Center of Excellence (COE) Best Practices and ISB framework services during the integration solution lifecycle. There is an ISB Center of Excellence folder in WebEx that includes all the COE documentation that was used. This can be found under Documents, under Group documents marked as “ISB Center of Excellence.”
- Use the National Information Exchange Model (NIEM) format for communication between ISB and CCMS core product, where available.
- Enable loose coupling of business services by designing data exchanges that:
 - Are independent of the state or condition of systems.
 - Are independent of the underlying implementation of endpoints.
 - Use asynchronous messaging where possible to promote an event-driven environment.

2.0 Design Assumptions

The following assumptions were made during the documentation of the functional requirements and design of data exchanges:

- Data exchanges are considered atomic, unless otherwise noted.
- Individual records in a batch are considered atomic. Errors that occur on any individual record do not impact the processing of any remaining records in the batch, unless otherwise noted.
- Inbound data exchanges that do not involve the Clerk Review module will automatically return an error response after the first error is encountered.
- The Clerk Review module handles any activity that requires review, or review and manual action, for an inbound transaction by a Court Clerk, (e.g., initiation of a Juvenile case, or if an error occurs in the processing of a traffic school completion notification.)
- Any data exchange performing an update will include the entire message set and not just the changing fields.
- Dynamic Data Classification (DDC) requirements will be documented in the *CCMS-V4 Security Design* deliverable and will be supported by the TIBCO BusinessWorks SmartMapper product.
- Additional justice partner system-specific non-functional payload elements are not included in this functional design deliverable, except for DMV, DOJ, EDS, and FTB-IIC.
- Any named components of data exchanges, (e.g., Web Services), are assumed to be hosted at the California Courts Technology Center (CCTC) and are named accordingly. The same data exchange components hosted at a local court (i.e., the Superior Courts of San Diego, Los Angeles, and Orange counties) will follow the same naming conventions, but will contain a different domain.

3.0 CCMS-V4 Data Exchange Business Scenario Patterns

All data exchanges will follow one of the following business scenario patterns:

- Request Reply Synchronous (RRS)
- Request Reply Asynchronous (RRA)

An explanation of terms and a description of patterns are provided in Section 3.1.

3.1 Definitions

The following business terms are defined for the CCMS project to enable consistent understanding among stakeholders.

- Request Reply communication is defined where:
 - The source system sends a request and expects a reply as depicted in Figure 1.

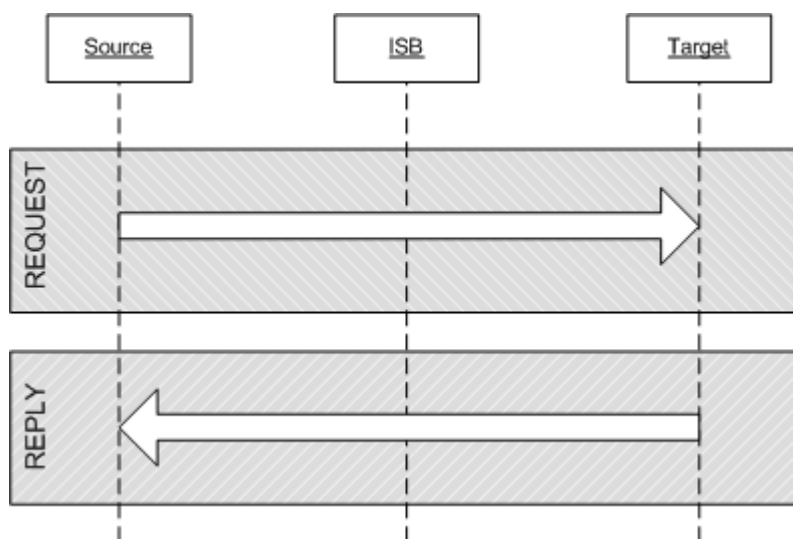


Figure 1. Request Reply

- The synchronous communication mode exists where:
 - A system initiates and maintains control of the communication event until completion.
- The asynchronous communication mode exists where:
 - A system initiates a communication event and hands over responsibility for completion of that event to another party.

Hence, the two data exchange business scenario patterns are defined as follows:

- Request Reply Synchronous (RRS)
 - The source system sends a request to the target system using the ISB and waits for the target system to respond.

- Request Reply Asynchronous (RRA)
 - The source system sends a request to the ISB and waits for an ownership response from the ISB (acknowledgement). The ISB then sends the request to the target system and waits for the target system to respond. The ISB then returns the response to the source system.

An additional communication pattern, allowing a dependency between multiple data exchanges has been introduced as part of the DX FFDP sign-off conditions. The pattern allows for the ISB to delay processing or reject data exchange messages which have a dependency on previously processed messages. The pattern is defined to address the functional requirement as follows:

- Integration partners invoke multiple data exchanges which are consumed by a single business process in CCMS, in a specific sequence. This results in cross data exchange messages dependencies
- Integration partners can send messages in different order; however, CCMS should continue to process messages in a specific sequence based on the business process. An example of a business process requiring a cross-data exchange dependency is the bail notification process, which cannot be started until the arrest warrant has been processed.

Exceptions are categorized as either transient or non-transient.

- Transient exceptions are defined as:
 - Exceptions where the ISB attempts to replay the message before reporting the error back to the source system. Transient exceptions are caused by temporary disruptions which may be resolved relatively quickly. The ISB makes a configurable number of attempts to replay the message and for a configurable period of time.
- Non-transient exceptions are defined as:
 - Exceptions where the ISB does not replay the message before reporting the error back to the source system. Non-transient exceptions are caused by unexpected or erroneous data, a permanent failure or non-availability of some resources.

Refer to [Appendix K - CCMS-V4 Data Exchange Errors](#) for a list of transient and non-transient exceptions that could occur in the ISB.

3.2 Request Reply Synchronous (RRS)

The following describes end-to-end interactions and exception flows for the Request Reply Synchronous business scenario pattern.

3.2.1 RRS primary flow

Figure 2 depicts the business flow of interactions between source, ISB, and target systems for the Request Reply Synchronous business scenario.

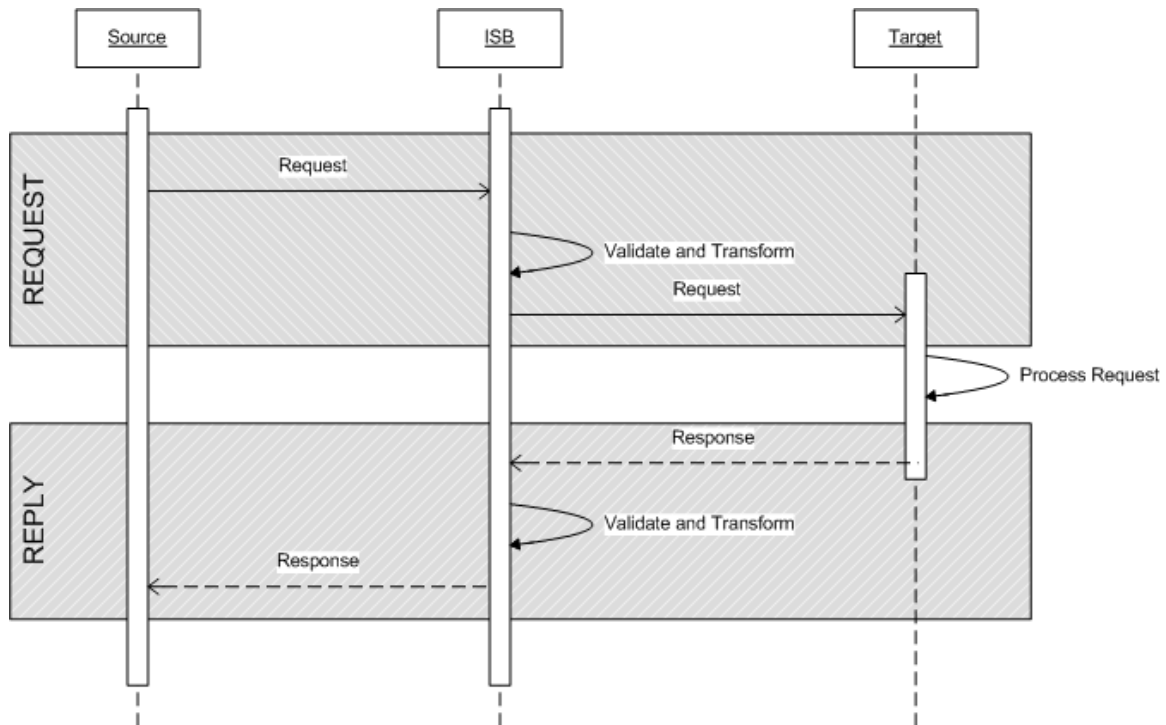


Figure 2. Request Reply Synchronous – Normal Flow

3.2.2 RRS flow with cross-data exchange message sequencing

Figure 3 depicts a scenario an inbound RRS exchange with a message for which the pre-requisite message has not yet been processed. In the RRS scenario, the CCMS system will reject inbound messages (unless the dependent data exchange messages have been processed) and provide a business error informing the Justice Partner of the pending data exchange dependency. Data exchange requests which have no cross-data exchange sequencing dependency (or if the dependency is met prior to data exchange invocation) will follow the pattern illustrated Section 3.2.1.

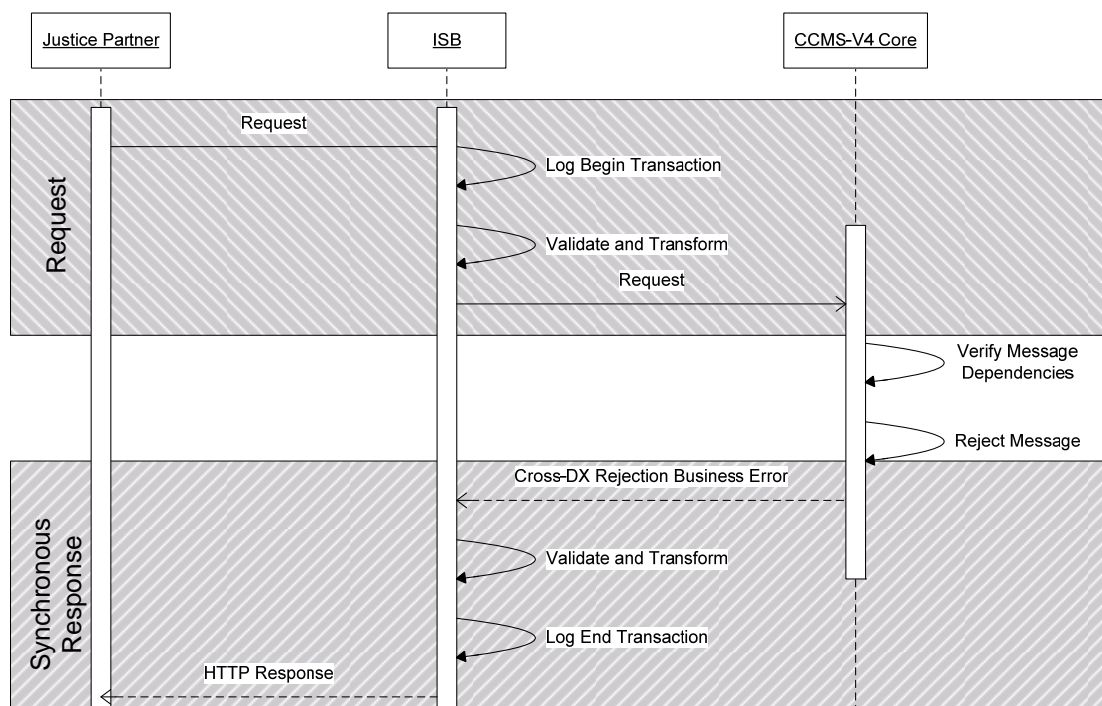


Figure 3. Request Reply Synchronous Cross-DX Message Sequencing Pattern

3.2.3 RRS exception flows

Figure 4 depicts the scenario where an exception occurs within the ISB, (e.g., validation or mapping failure) before the request is forwarded to the target system. The ISB handles the exception and sends a response (containing failure reason) to the source system.

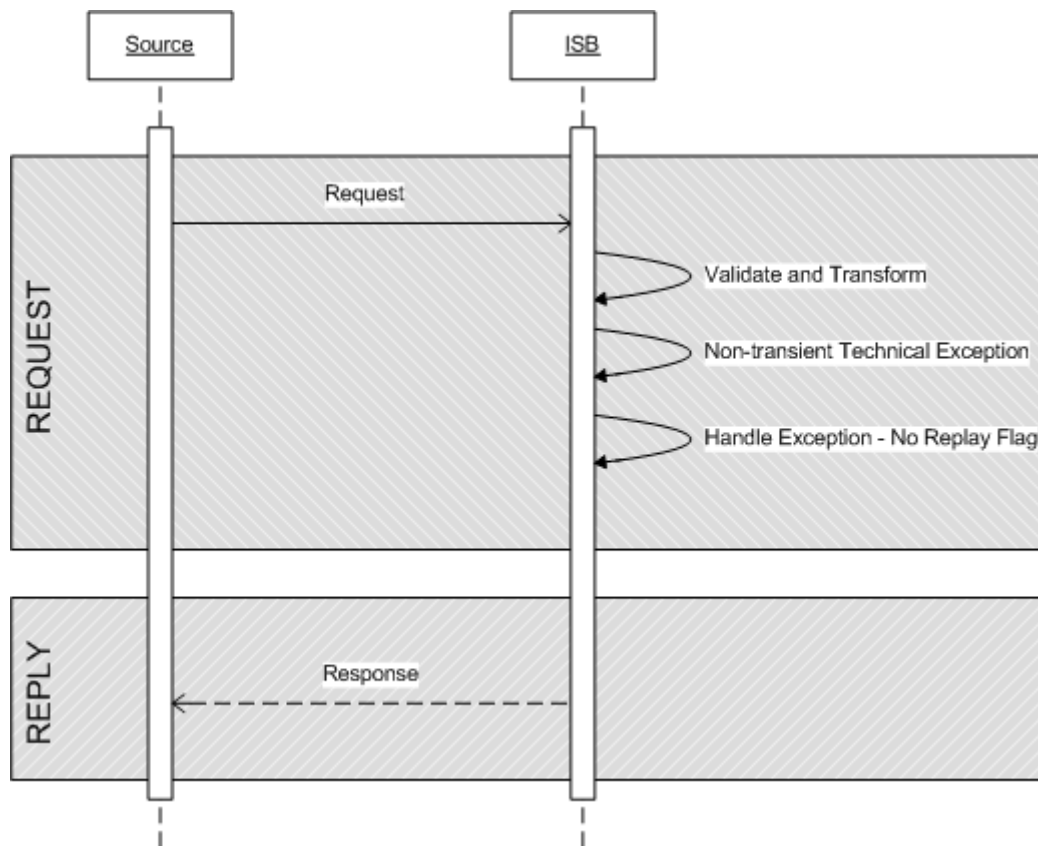


Figure 4. Request Reply Synchronous – Exception Flow1

Figure 5 depicts the scenario where an exception occurs when the ISB attempts to forward the request to the target system. The ISB handles the exception and sends a response (containing failure reason) to the source system.

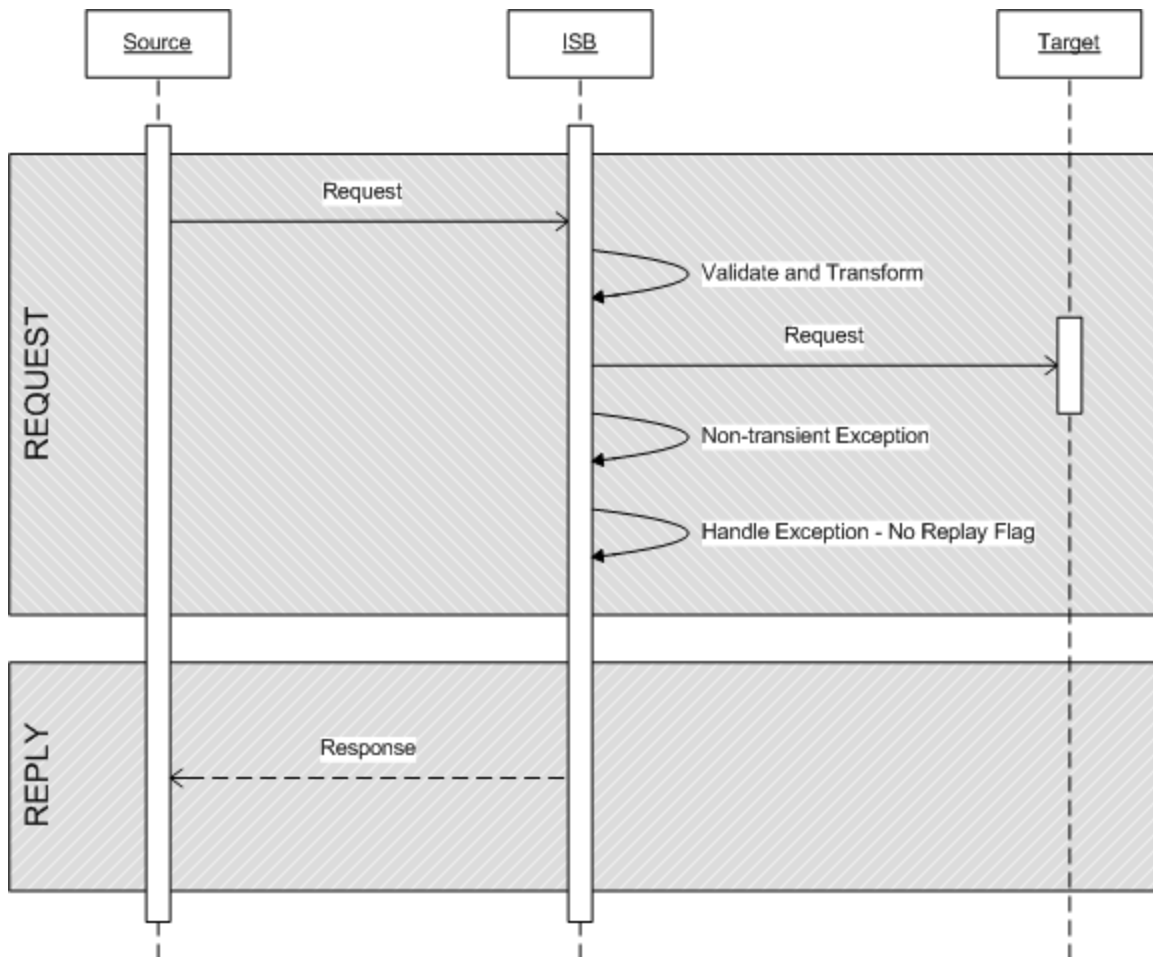


Figure 5. Request Reply Synchronous – Exception Flow2

3.3 Request Reply Asynchronous (RRA)

The following describes end-to-end interactions and exception flows for the Request Reply Asynchronous business scenario pattern.

3.3.1 RRA primary flow

Figure 6 depicts the business flow of interactions between source, ISB, and target systems for the Request Reply Asynchronous business scenario.

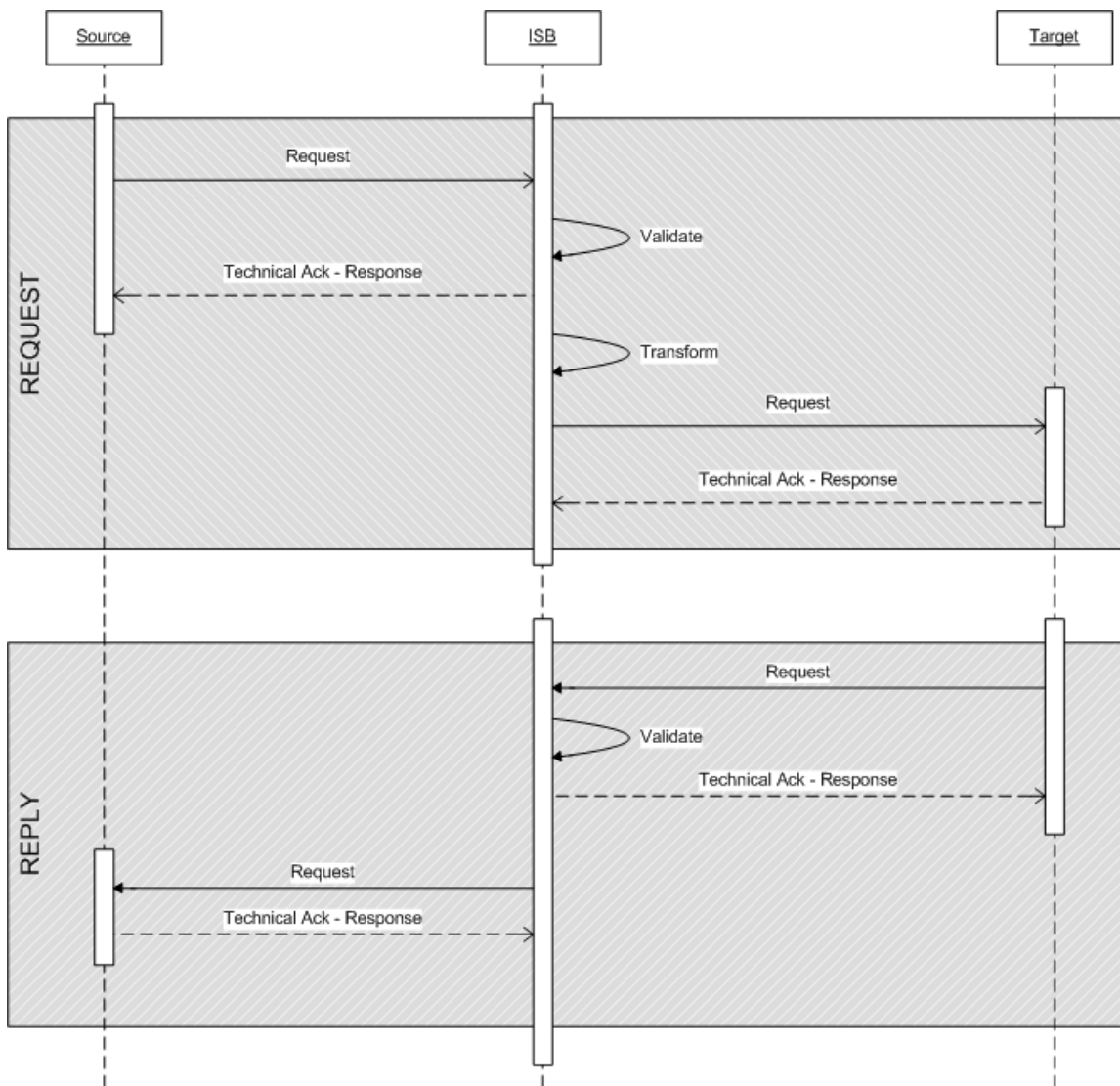


Figure 6. Request Reply Asynchronous – Normal Flow

3.3.2 RRA flow with cross-data exchange message sequencing

Figure 7 depicts a scenario an inbound RRA exchange invocation with a dependency on a not yet processed message. In this scenario, the CCMS system will hold and store the inbound message until the pre-requisite messages have been processed. The asynchronous business response message will be sent until after both the dependent and the existing message are processed. Data exchange requests that have no cross-data exchange sequencing dependency (or if the dependency is met prior to data exchange invocation) will follow the pattern illustrated in Section 3.3.1

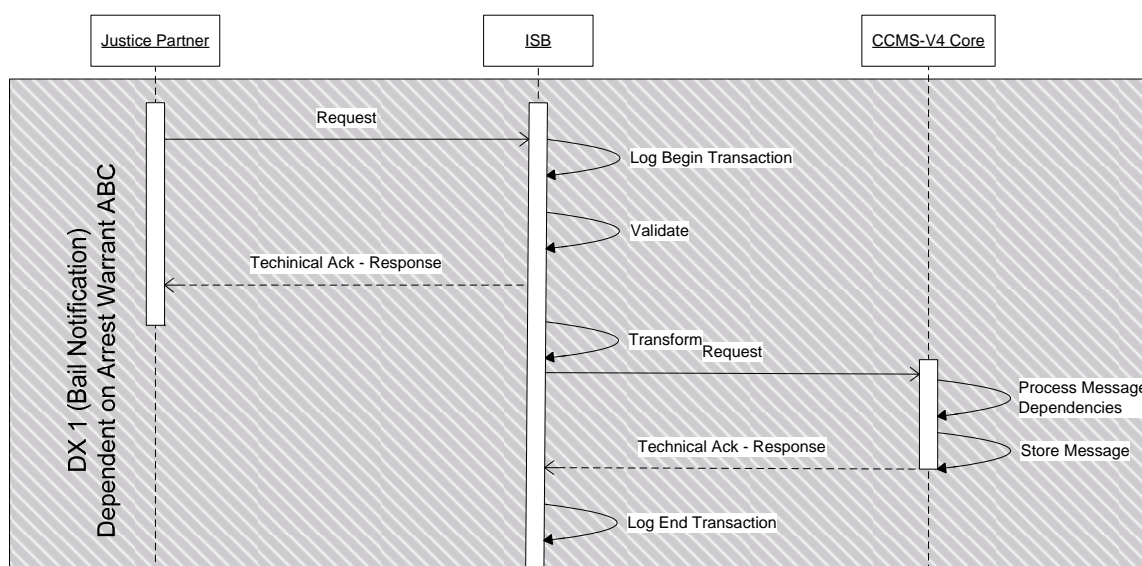


Figure 7. Asynchronous Cross-DX Message Sequencing Flow for DX1 Request

Figure 8 depicts a scenario where the dependent message is received by the CCMS core system and successfully completes processing. Upon completing the processing for the dependent message (DX 2), CCMS will be able to process the original message (DX 1).

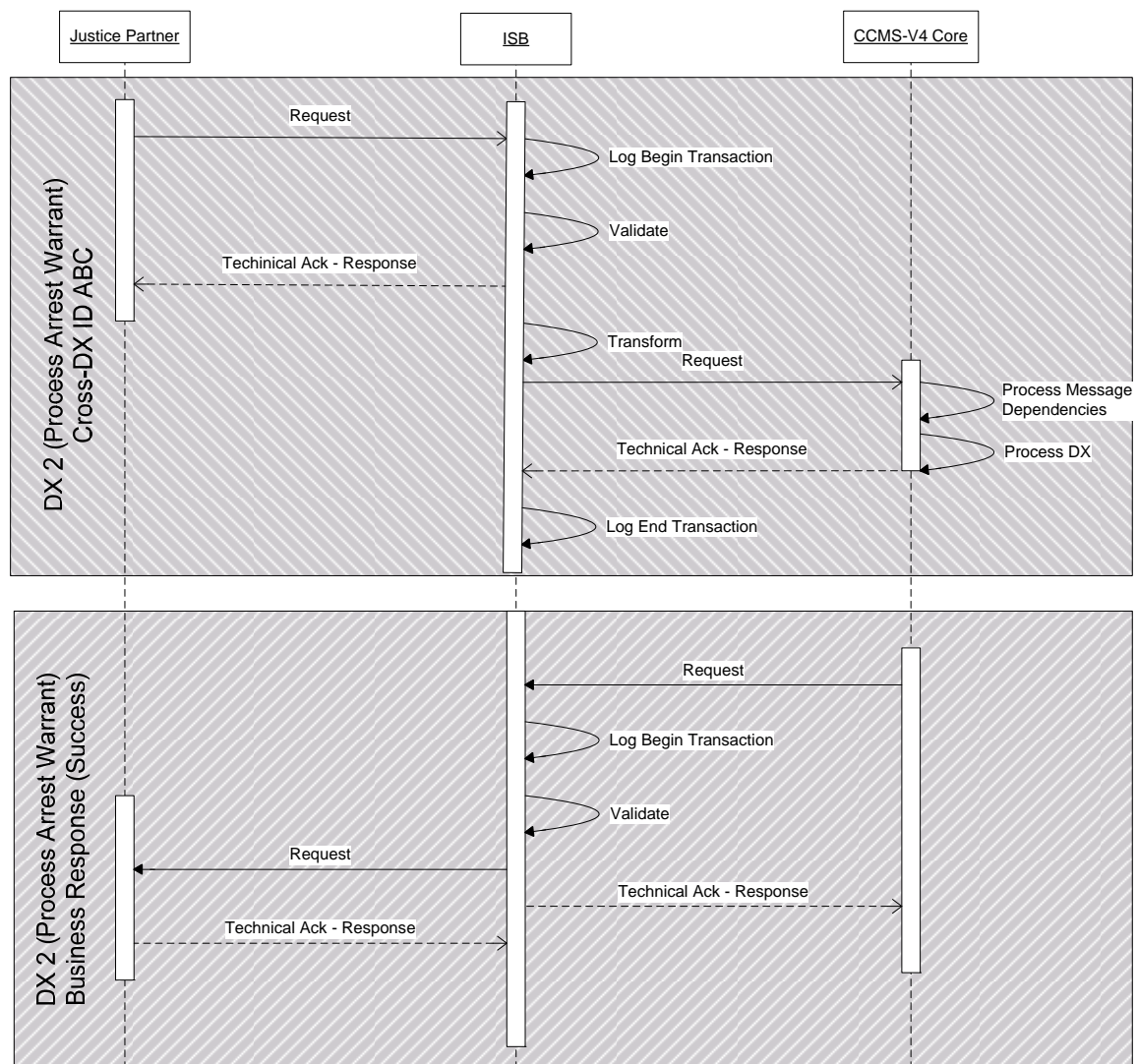


Figure 8. Asynchronous Cross-DX Message Sequencing Flow for DX2

Figure 9 depicts completion of the Cross-DX sequencing scenario. The CCMS core system completes processing for the original DX (DX 1) after the dependent DX (DX 2) has completed processing.

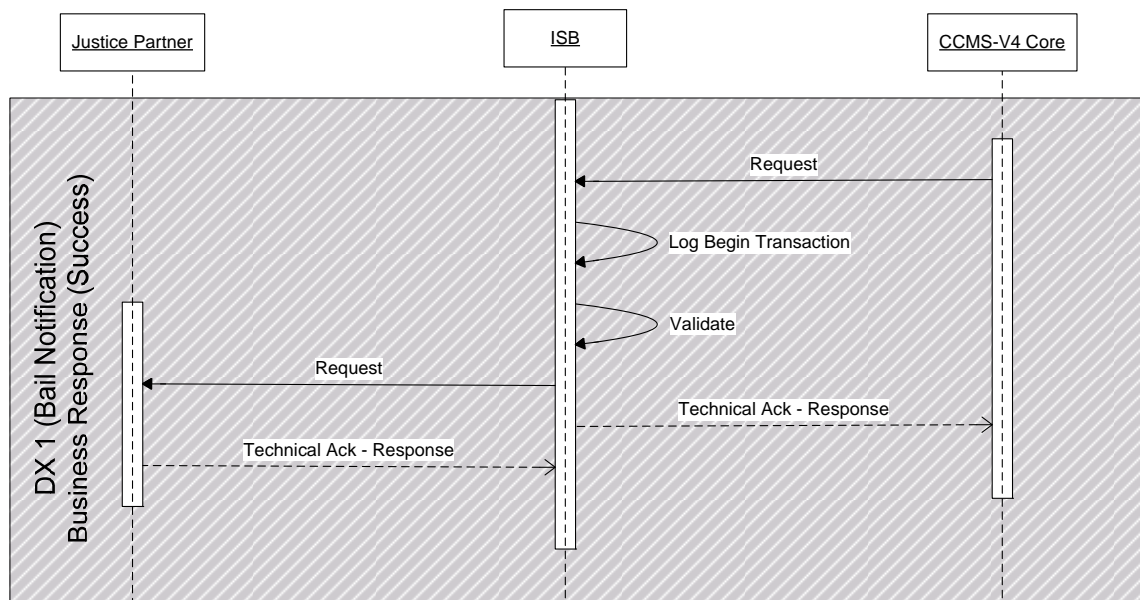


Figure 9. Asynchronous Cross-DX Message Sequencing Flow for DX1 Response

3.3.3 RRA exception flows

Figure 10 depicts the scenario where the ISB has returned a positive acknowledgement to the source system, and an exception occurs within the ISB, (e.g., message out of sequence) before the request is forwarded to the target system. The ISB handles the exception and sends a response (containing failure reason) to the source system.

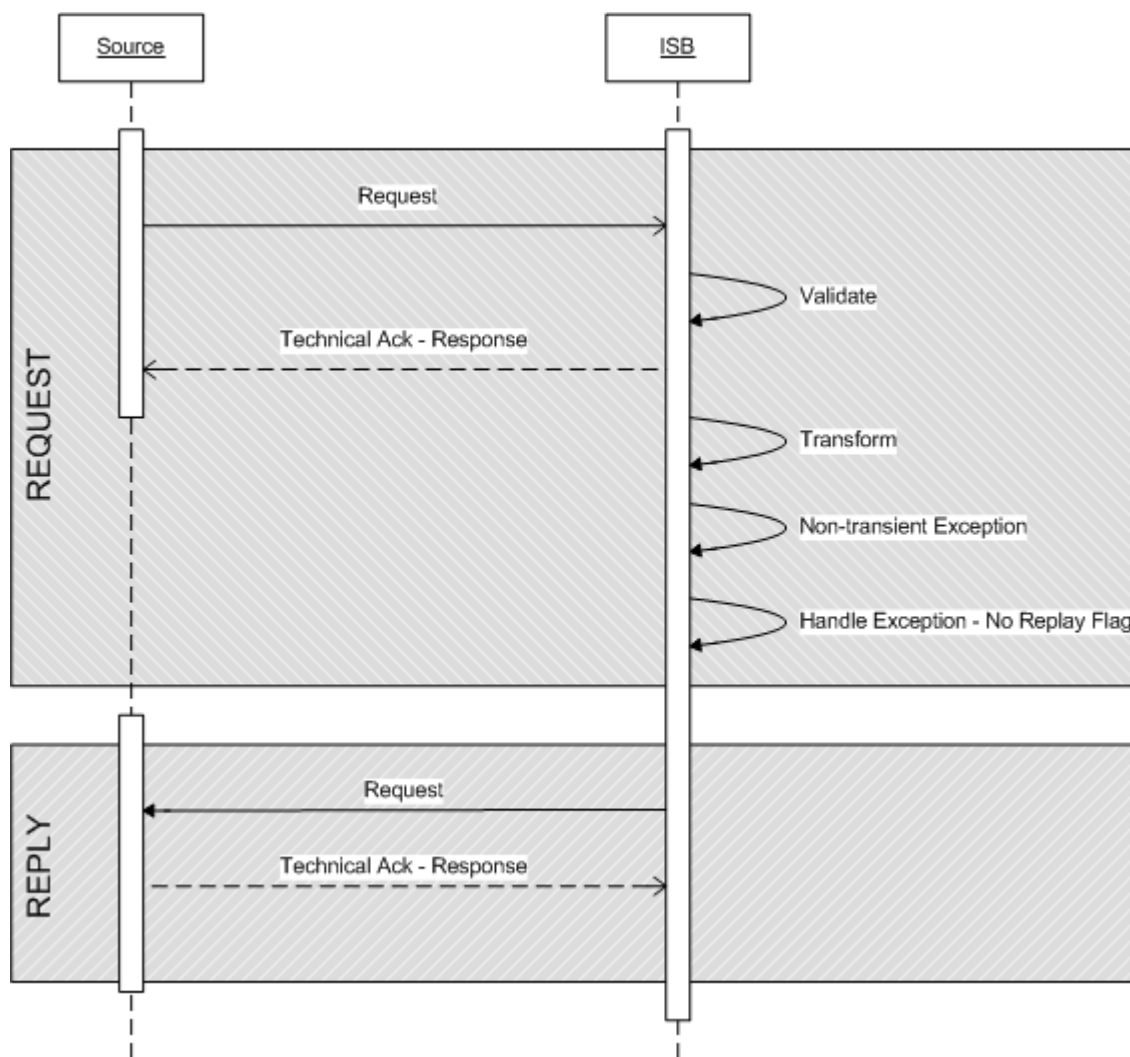


Figure 10. Request Reply Asynchronous – Exception Flow 1 (Positive Acknowledgement Sent To Source but ISB Encountered Non-transient Error)

Figure 11 depicts the scenario where the ISB has returned a positive acknowledgement to the source system, and an exception occurs when the ISB attempts to forward the request to the target system. The ISB handles the exception and sends a response (containing failure reason) to the source system.

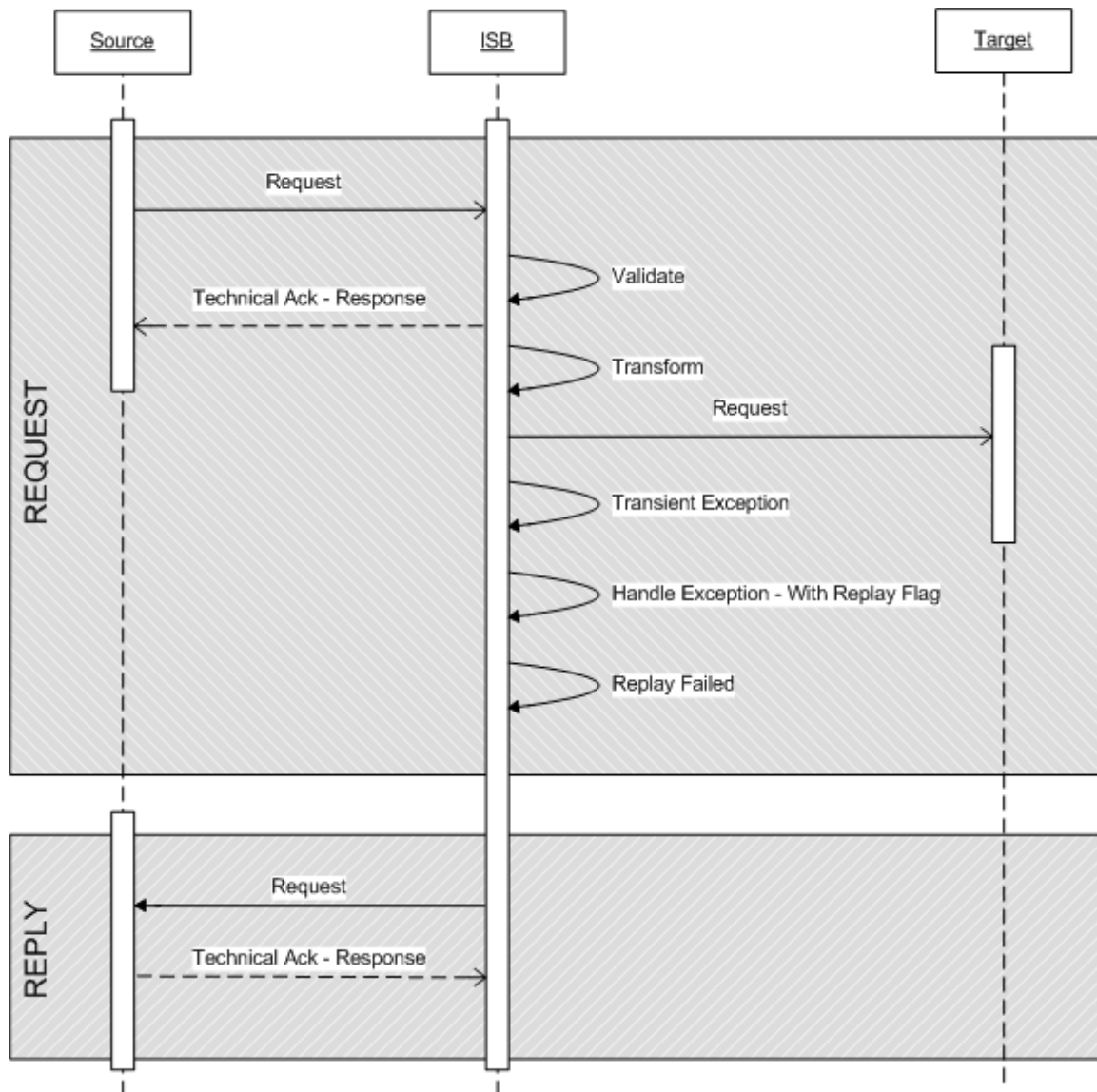


Figure 11. Request Reply Asynchronous – Exception Flow 2 (Positive Acknowledgement Sent To Source But Target System Does Not Respond Resulting in Transient Exception)

Figure 12 depicts the scenario where the ISB forwards the request to the target system and receives a negative acknowledgement, (e.g., syntactic data error) from the target system. The ISB handles the exception and sends a response (containing failure reason) to the source system.

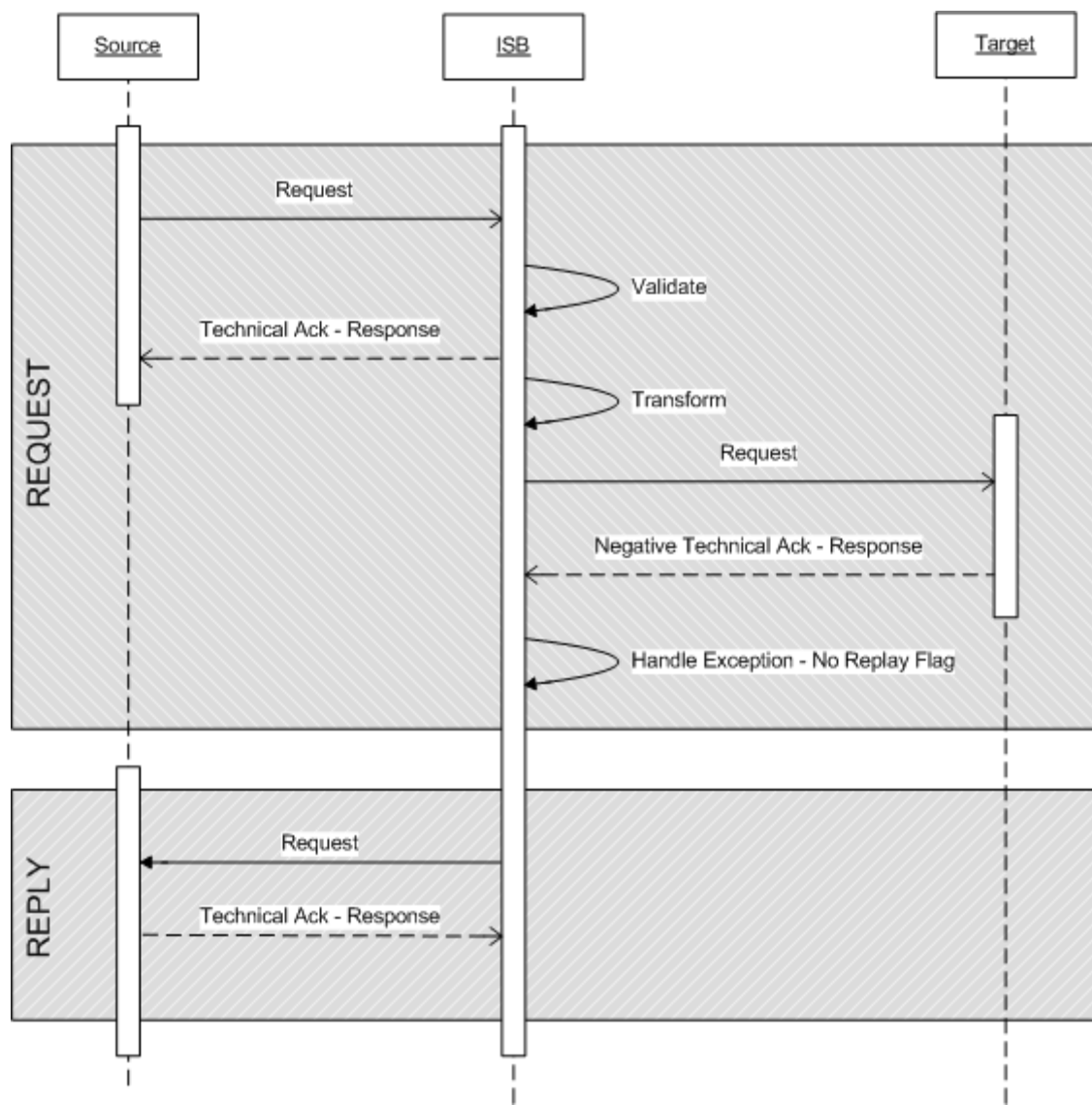


Figure 12. Request Reply Asynchronous – Exception Flow 3 (Positive Acknowledgement Sent To Source But Target System Returns a Negative Acknowledgement)

