7.3 Service modes

Operations and notifications, on an Association, are used in one of the following two modes:

a) synchronous
b) asynchronous

In the synchronous mode, the invoking DIMSE-service-user, on an established Association, requires a response from the performing DIMSE-service-user before invoking another operation or notification.

In the asynchronous mode, the invoking DIMSE-service-user, on an established Association, may continue to invoke further operations or notifications to the performing DIMSE-service-user without awaiting a response. In the asynchronous mode, the performing DIMSE-service-user may respond to the operations or notifications in a different order than they were received.

The mode selection (synchronous or asynchronous) is determined at Association establishment time. The synchronous mode serves as the default mode and shall be supported by all DIMSE-service-users. The asynchronous mode is optional and the maximum number of outstanding operations/notifications is negotiated during Association establishment. This negotiation is accomplished by Application Association Information as defined in Annex D.
Section D.3.3.3, Add notifications to the descriptions and clarify roles and how they relate

The Asynchronous Operations Window is used to negotiate the maximum number of outstanding operation or sub-operation requests (i.e. command requests) for each direction. The synchronous operations mode is the default mode and shall be support by all DICOM AEs. This negotiation is optional.

The Association-requester conveys in the A-ASSOCIATE request:
- **when negotiating the SCU role for operations,** the maximum number of outstanding operations it may invoke asynchronously;
- **when negotiating the SCP role for operations,** and/or the maximum number of outstanding sub-operations it may invoke asynchronously;
- **when negotiating the SCP role for notifications,** the maximum number of notifications it may invoke asynchronously.

The Association-acceptor conveys in the A-ASSOCIATE response:
- **when negotiating the SCP role for operations,** the maximum number of outstanding operations it may invoke asynchronously;
- **when negotiating the SCU role for operations,** and/or the maximum number of outstanding sub-operations it allows the Association-requester to invoke asynchronously;
- **when negotiating the SCU role for notifications,** the maximum number of outstanding notifications it allows the Association-requester to invoke asynchronously when negotiating the SCU role. This number shall be equal or less than the number of outstanding notifications, operations and/or sub-operations offered to invoke (by the A-ASSOCIATE indication).

A value of zero indicates that the above parameters are unlimited. If the Asynchronous Operations Window is absent the default for the above parameters shall be equal to one.

The Association-acceptor conveys in the A-ASSOCIATE response:
- **when negotiating the SCP role for operations,** the maximum number of outstanding operations; **when negotiating the SCU role for operations,** the maximum number of and/or sub-operations it allows the Association-requester to invoke asynchronously; **when negotiating the SCU role for notifications,** the maximum number of outstanding notifications it allows the Association-requester to invoke asynchronously when negotiating the SCU role. This number shall be equal or less than the number of outstanding notifications, operations and/or sub-operations offered to invoke (by the A-ASSOCIATE indication).

A value of zero indicates that the above parameters are unlimited. If the Asynchronous Operations Window is absent the default for the above parameters shall be equal to one. Figures D.3-5 and D.3-6 illustrate examples of Asynchronous Operations Window negotiation.

If this negotiation is not present in the A-ASSOCIATE indication it shall be omitted in the A-ASSOCIATE response.

Note: The case where the Association-requester offers the value of zero (which indicates unlimited operations), the Association-acceptor may return zero (agreeing to unlimited operations) or negotiate the parameter a