

NEWSFEED Interface Requirements Specification

NEWSFEED Solutions

IRS Version 3.0
May 2021

Introduction

NEWSFEED is a subscription service which publishes small news messages on a range of topics. Subscribers of the service can specify the list of topics which they are interested in. The NEWSFEED application will only publish news messages of topics subscribed to by a subscriber. Since version 2 of the service, NEWSFEED announces all available topics. Version 3 introduced a means to communicate a new topic to subscribers.

In this specification the NEWSFEED application which offers the NEWSFEED service is often simply called NEWSFEED.

State Transition diagram

Figure 1 shows the state transition diagram of the communication between the NEWSFEED application and a subscriber. The diagram is considered from the point of the NEWSFEED application. Messages prefixed with ? are inputs for the NEWSFEED application. Messages prefixed with ! are outputs of the NEWSFEED application.

The state transition diagram only depicts the *happy flow* of the service: unexpected messages (from the subscriber) are not included in the diagram. The requirements below discuss the various messages and transitions in detail. If the requirements and state transition diagram are in conflict, the requirements prevail.

Requirements

General

- CASE-01 The NEWSFEED application is case sensitive. The string 'sport' is different from 'SPORT' and 'SpOrT'. The NEWSFEED application only uses lowercase letters for its topics, though.
- RESP-TIME-01 The response time for the NEWSFEED application is 1.0 seconds. After receiving a *Request message the NEWSFEED application should respond within 1.0 seconds with a corresponding *Response message.
- CORR-ID-01 The NEWSFEED service uses correlation identifiers (i.e., attribute CorrelationId) to correlate *Request and corresponding *Response messages. For the *Response messages, the NEWSFEED application should use the same correlation identifier as specified in the *Request message.
- FAULT-01 If the NEWSFEED application receives an unexpected message from a subscriber (i.e., not defined in this specification), NEWSFEED should ignore the message and respond with a Fault message. The Fault message does not have any attributes.

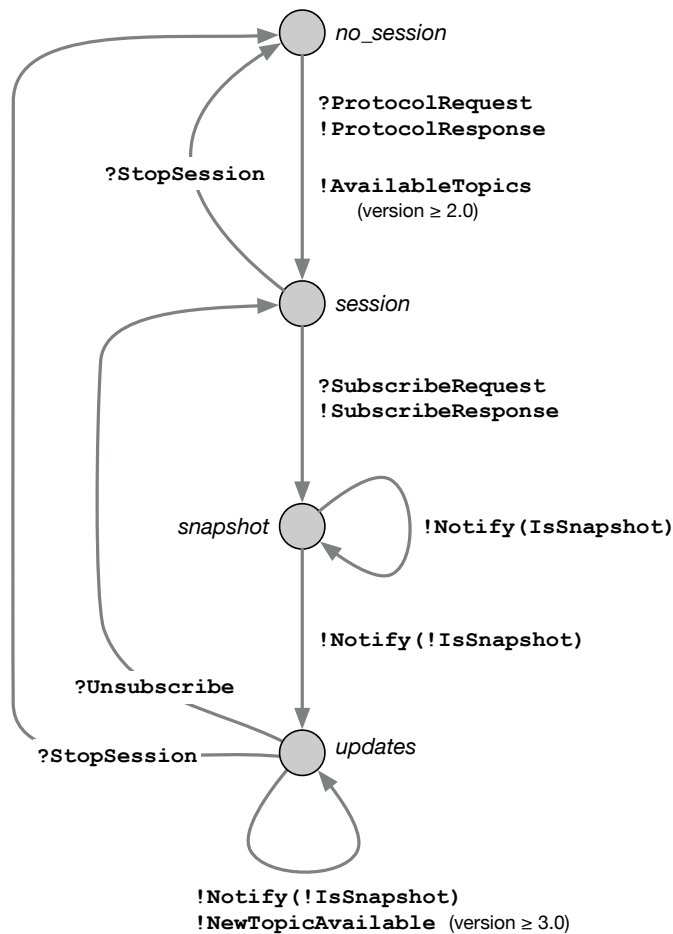


FIGURE 1 State Transition diagram of the NEWSFEED application.

Versions

- VERSIONS-01 There are several versions of this specification of the NEWSFEED service and application.
- 1.0 First version of the NEWSFEED service.
 - 2.0 NEWSFEED announces the list of topics with an AvailableTopics message.
 - 2.1 Bug fixes and minor improvements.
 - 3.0 Support for the NewTopicAvailable message.
- There are no functional differences between 2.0 and 2.1.
- VERSIONS-02 When the version decided upon is at least 2.0, NEWSFEED will send a AvailableTopics message. See also TOPICS-02.
- VERSIONS-03 When the version decided upon is at least 3.0, NEWSFEED might send a NewTopicAvailable messages. See also TOPICS-03.

Protocol Negotiation

A subscriber and the NEWSFEED application have to agree on certain aspects of the connection and the session. The subscriber takes the initiative for the protocol negotiation.

- SESSION-01 A subscriber sends a ProtocolRequest message to the NEWSFEED application with the preferred protocol versions for the session. A ProtocolRequest message has the following attributes:
- ProtocolVersions: a list of strings specifying the preferred version of the NEWSFEED service. The list is ordered by preference for the version to be used.
 - CorrelationId: an unique integer value (for the session) identifying this request.
- SESSION-02 After receiving a ProtocolRequest message, the NEWSFEED application checks the validity of the attributes of the ProtocolRequest. NEWSFEED will select the first valid protocol version that it supports. Non-existing versions in the list will be ignored.
- SESSION-03 The NEWSFEED application replies to the ProtocolRequest message with a ProtocolResponse message. A ProtocolResponse message has the following attributes:
- ProtocolVersion, a string specifying the version of the protocol that will be used for the session.
 - CorrelationId, an integer: the same CorrelationId which was received in the ProtocolRequest message.
- SESSION-04 When the ProtocolRequest message of a subscriber does not contain any supported protocol version, NEWSFEED should refuse the session by sending a ProtocolResponse message where the ProtocolVersion is an empty string (i.e., '').
- SESSION-05 At any time, a subscriber may offer a new ProtocolRequest message to start a new protocol negotiation. If this happens when there is already an active subscription, this active subscription will be terminated. The current session will be terminated as well.
- SESSION-06 At any time, a subscriber may offer a StopSession message to end the current session (including any active subscription). The NEWSFEED application does not acknowledge this message.

Available topics

For version 1.0 of the NEWSFEED service the set of available topics is fixed and constant. Since version 2.0 of the service, NEWSFEED announces the list of available topics.

- TOPICS-01 NEWSFEED version 1.0 supports the following five default topics: general, breaking, sport, weather and culture.
- TOPICS-02 *Only for version 2 and higher.* When the protocol negotiation was successful, the NEWSFEED application will send an AvailableTopics message with a list of all topics that the NEWSFEED application currently supports. An AvailableTopics message has a single attribute:
- Topics, a list of strings, each specifying a single topic.

Subscriptions

After a successful protocol negotiation a subscriber can start a subscription.

- SUBSCR-01 A subscriber offers a `SubscribeRequest` message to the NEWSFEED application with some preferred settings of the subscription. The NEWSFEED application replies with a `SubscribeResponse` message specifying the settings that will be used.
- SUBSCR-02 A `SubscribeRequest` message has the following attributes:
- `Topics`, a list of strings, each specifying a topic.
 - `CorrelationId`: an unique integer value (for the session) identifying this request.
- SUBSCR-03 After receiving a `SubscribeRequest` message, NEWSFEED will reply with a `SubscribeResponse` message with the list of topics of the subscription. Topic names within the `SubscribeRequest` which are not available, will be ignored. A `SubscribeResponse` message has the following attributes:
- `Topics`, a list of strings, each specifying a topic which will be active for this subscription.
 - `CorrelationId`, an integer: the same `CorrelationId` which was received in the `SubscribeRequest` message.
- SUBSCR-04 If the list of `Topics` of a `SubscribeResponse` message is empty – i.e., does not contain any topic – NEWSFEED will still publish (empty) heartbeat messages to indicate that the session and subscription are still alive.
- SUBSCR-05 At any time, a subscriber can start a new subscription by sending a new `SubscribeRequest` to NEWSFEED. The new subscription replaces the current subscription.
- SUBSCR-06 At any time, a subscriber can stop the active subscription by sending a `Unsubscribe` message. After this message, the session between NEWSFEED and the subscriber remains active, but the NEWSFEED application will not longer send any messages. A subscriber can start a new subscription with a new `SubscribeRequest` message.

News messages

When a subscription is active, the NEWSFEED application will send `Notify` messages to its subscribers.

- NOTIFY-01 A `Notify` message has the following attributes:
- `SequenceNumber`, an integer which specifies the sequence number of this `Notify` message,
 - `IsSnapshot`, a boolean that is true if the message is part of the snapshot, false otherwise,
 - `Topic`, a string which specifies the topic to which this message belongs, and
 - `Content`, a string, the actual content of the message.

- NOTIFY-02 The first `Notify` message of a subscription has `SequenceNumber` 0. The sequence number is incremented for each subsequent `Notify` message, including heartbeat messages. The sequence number overflows after reaching 255. The sequence number is reset to 0 for each new subscription.
- NOTIFY-03 NEWSFEED will only publish `Notify` messages for which the `Topic` attribute is one of the topics the client is subscribed to.
- SNAPSHOT-01 After sending a `SubscribeResponse`, NEWSFEED will send a snapshot of its current list of news items. For each news item, NEWSFEED will send a `Notify` message for which the attribute `IsSnapshot` is true.
- UPDATES-01 After publishing the snapshot, NEWSFEED can send new messages to its subscribers. For these ‘update’ messages, the attribute `IsSnapshot` is false.
- HEARTBEAT-01 The NEWSFEED application ensures that each `NotifyTime` seconds, each subscriber with an active subscription will receive at least one `Notify` message. If there is no new news message, NEWSFEED will send a so-called ‘heartbeat’ `Notify` message. The constant `NotifyTime` is equal to 3 seconds.
- HEARTBEAT-02 A heartbeat `Notify` message is a message where the `Topic` attribute is equal to the empty string, the `Content` attribute is also equal to the empty string, and the `IsSnapshot` attribute is false.

New Topics

- TOPICS-03 *Only for version 3 and higher.* At any time during a session, the NEWSFEED application may announce new topics to its subscribers. A new topic will be announced by a `NewTopicAvailable` message. The `NewTopicAvailable` message has a single attribute:
- `Topic`, a string: the name of the new topic.