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Guide for application developers on session continuity by using MIF API
           draft-deng-mif-api-session-continuity-guide-02

Abstract

   Today most smart terminals are equiped with multiple interfaces such
   as 3G/LTE and WiFi, and users experience some loss of connectivity
   while switching interfaces. The MIF API draft
   [I-D.ietf-mif-api-extension] has specified an API to announce
   interface status information to the applications. Once the
   application receives such information, it can use this information
   reconnect to its peer(s), and this could significantly improve the
   user experience.

Requirements Language

   The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT",
   "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this
   document are to be interpreted as described in RFC 2119 [RFC2119].

Status of this Memo

   This Internet-Draft is submitted in full conformance with the
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Table of Contents

[1](#). **Introduction**

A significant and increasing number of smart mobile terminals have
multiple interfaces for connectivity (e.g. Wifi and 3G/LTE). These
interfaces may have very characteristics in terms of reliability,
available bandwidth, delay/jitter as well as cost per bit. There is
some form of connection manager on the end device that picks an
interface for communication based on some pre-configured policy
and/or based on dynamic conditions. The initially selected interface
may become deprioritized (e.g. due to a lower cost interface becoming
available) or may become unavailable (e.g. due to loss of coverage
when moving out of a WiFi hotspot). New interfaces may become
available due to administrative action (e.g. manual activation of a
specific connectivity technology) or due to dynamic conditions (e.g.
entering coverage area of a wireless network or plugging in an
ethernet cable). In order to handle such changes in connectivity,
applications need to be aware of network status changes and react to
them. This document provides a guide to writing such applications.

The MIF API [I-D.ietf-mif-api-extension] document specifies an API
that is capable of providing information regarding changes in network
and interface connectivity status. By using this information,
application developers can develop applications that can survive
changes in connectivity and even benefit from them.

[2](#). **Related MIF API information**

MIF API draft [I-D.ietf-mif-api-extension] defines a few messages
that are related to notifying whether an interface is available or
not. The messages are defined in Section 3.5.1 (Announce Interfaces)
and Section 3.5.4 (No Inteface). Similar functionaility is available
for addresses using the messages defined in Section 3.5.12 (Announce
Address) and Section 3.5.14 (No Address Announcement). Both
interface and address information could be used by the application to
infer the availablility of a new endpoint for communication or the
loss of an existing endpoint for communication.

[3](#). **Using different source address to reconnect the server**

The applications deployed on mobile hosts usually setup the
connection with the server, then trying to keep the connection up as
long as they can. This works reasonable well when the host has only
one communication interface. Once the host has more than one
communication interface, such as 3G/LTE and WLAN, such applications
cease to work well. e.g. The per bit cost and the connection speed
are different on these two interfaces, and the user would always

prefer to change another cheaper and faster connection. e.g. While
connecting to a WLAN interface after being connected to LTE, the
mobile terminal would get a different set of configuration parameters
including the IP address, DNS server and default gateway.
Application would normally break after such change in connectivity if
the original interface (3G/LTE) is turned off and manual intervention
is usually required to reinitiate connectivity.

If the application is designed with changing network connectivity in
mind, then the application could be carefully designed reconnect to
its peer based on MIF API notification about new interface(s) and/or
new address(es).

It is most cases even when a mobile terminal gets WLAN connectivity
and gets an IP address assgined, but it could still be disconnected
from the Internet due to lack of authentication. As a consequence,
the interface needs to be tested for internet connectivity before
switching communication from an existing interface to a newly
available interface.

**[4](). Generic guidelines for writing applications to handle new interfaces
    becoming available**

The recommended steps for the application developer to keep the
session continuity based on MIF API are listed below:

Step 1: Application connects to the server based on interface 1
(either 3G/LTE or WLAN);

Step 2: Application subscribes to the MIF API for interface and
address change notifications;

Step 3: When a new interface comes up or a new address is configured,
the MIF API notifies the application.

Step 4: The application tries to re-connect to its peer from the
newly available interface. If the connectivity check succeeds, then
the application can successfully switch the communication over to the
new interface based on policy or user initiated selection. Otherwise
communication stays on the existing inteface..

Step 5: The interface initially used for communication may now be
turned off without disrupting communications.

5. **Generic guidelines for writing applications to handle interfaces
    becoming unavailable**

   The recommended steps for the application developer to keep the
   session continuity based on MIF API are listed below:

   Step 1: Application connects to the server based on interface 1
   (either 3G/LTE or WLAN);

   Step 2: Application subscribes to the MIF API for interface and
   address change notifications;

   Step 3: When an interface or address, that is currently being used
   for communication, becomes unavailable the MIF API notifies the
   application.

   Step 4: The application requests the MIF API to acquire a list of
   interfaces that are currently available. Based on locally configured
   preferences, the application tries to re-connect to its peer from one
   of the available interfaces. If the connectivity check succeeds,
   then the application can successfully switch the communication over
   to this interface.

   Step 5: If the connectivity check fails, the application needs to
   redo the check for each of the available interfaces in order of
   preference until it can successfully connect to its peer.

   Step 6: If at least one available interface is still able to connect
   to the peer, the application can switch over to this interface
   without disrupting communications.

6. **IANA Considerations**

   This document does not require any IANA actions.

7. **Security Considerations**

   Some applications may associate the the source address of the
   communication with the credentials used, it they may require
   refreshing the credentials after the application switches to using a
   new source address.

8. **Acknowledgements**

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Liu and Dave Thaler for their comments and suggestions for improving
this document.

[9](). Normative References

[I-D.ietf-mif-api-extension]
          Liu, D., Lemon, T., Ismailov, Y., and Z. Cao, "MIF API
          consideration", draft-ietf-mif-api-extension-00 (work in
          progress), March 2012.

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate
          Requirement Levels", BCP 14, RFC 2119, March 1997.

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