





INTERNATIONAL TELECOMMUNICATION UNION

**RADIOCOMMUNICATION  
STUDY GROUPS**

**Document 8F/  
September 2002  
English only**

Received: September 2002

Subject: Question ITU-R 229/8 and 230/8

**VISION  
RTECH  
AD HOC WORKPLAN**

## **SOFTWARE DEFINED RADIO FORUM**

### **INFORMATION FROM SDR FORUM ON DOWNLOAD AND REGULATORY ISSUES FOR SOFTWARE DEFINED RADIO**

The Software Defined Radio Forum has embarked recently on the development of two series of technical documents that may be of interest to the ITU-R Working Party 8F. The first series is on software download for RF reconfiguration. The second series are reports on issues and activity in the area of security for software defined radio.

Attachment 1 provides brief descriptors of each of seven documents on software download for RF reconfiguration that the SDR Forum is preparing. The first of these documents, Doc. DL-DFN (SDRF-02-A-0002-V0.00), "Overview and Definition of Software Download for RF Reconfiguration," is available at the following web address:

<http://www.sdrforum.org/doclist.html> (Document 2002-A2 in the approved document list)

The remainder of the download series of documents are scheduled for completion by 1Q 2003.

Attachment 2 is the executive summary for a report that the SDR Forum has provided to the United States Federal Communications Commission (FCC). Although it was specifically sent to the FCC in response to requests for such information in the FCC Report and Order on Software Defined Radio, this document is intended to be global in nature. The Forum believes that this document is of interest to regulatory agencies throughout the world. This document is available at:

<http://www.sdrforum.org/doclist.html> (Document 2002-

This document is the first of two documents that the Forum is producing on this subject. The second document will be completed in 1Q 2003.

The SDR Forum points of contact for these documents are:

Download Documents:  
Jim Hoffmeyer  
Representing Panasonic  
+1 303-828-5240  
[jhoffmeyer@aol.com](mailto:jhoffmeyer@aol.com)

Security Issues Documents:  
Mike Chartier  
Intel Corporation  
+1 480- 554-9274  
[mike.s.chartier@intel.com](mailto:mike.s.chartier@intel.com)

Attachments 2

## ATTACHMENT 1

### SDR FORUM SERIES OF DOCUMENTS ON SOFTWARE DOWNLOAD FOR RF RECONFIGURATION

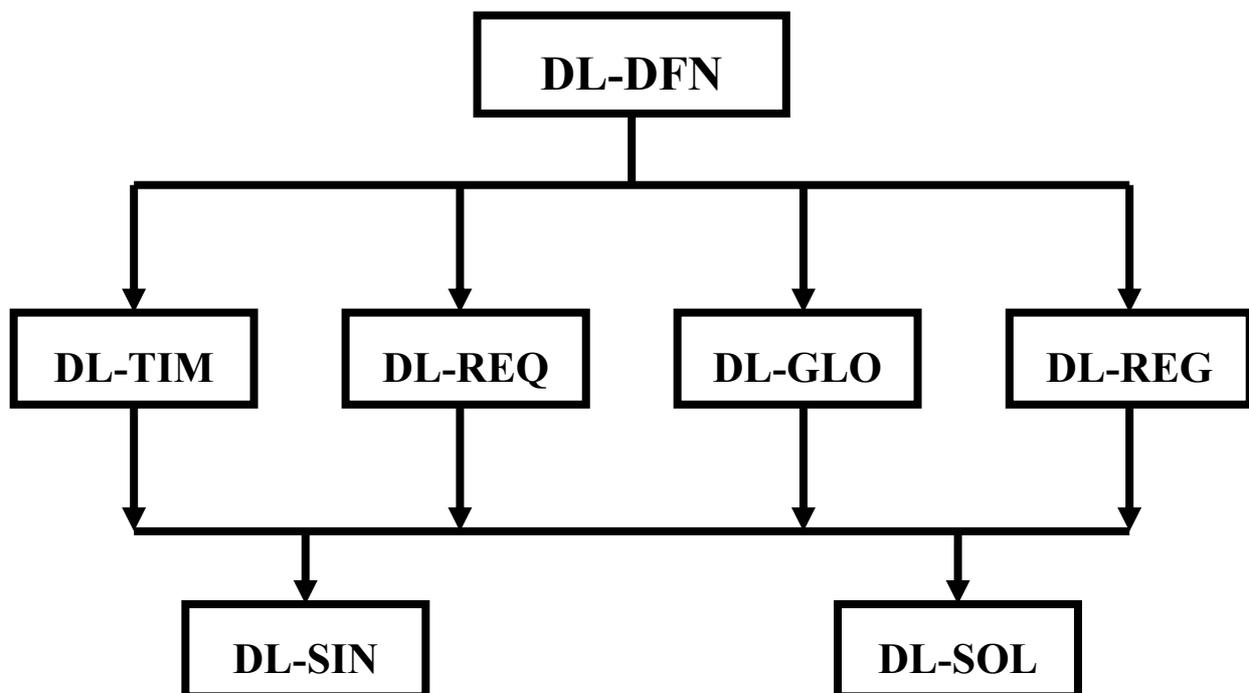
The SDR Forum is in the process of developing a series of documents on software download for RF reconfiguration. The purpose of these documents is to define the requirements for software download, provide a survey of global standards activities on this topic, a summary of regulatory activities on SDR, a timeline for work on this topic by various international standards and regulatory organizations, and technical specifications of common global solutions for software download for RF reconfiguration. This work is based on earlier SDR Forum work documented in the SDR Forum Technical Report 2.1, "Architecture and Elements of Software Defined Radio Systems as Related to Standards," November 1999.

The documents in this series are:

- ◆ DL-DFN: Overview and Definition of Software Download for RF Reconfiguration: This document provides a complete high-level perspective on the scope of radio software download (that is, the downloading of software for RF reconfiguration) in the context of software defined radio (SDR) terminals and base stations with reference to applications, requirements, methods and implementations. The document presents a list of considerations that are relevant to the development of detailed requirements. The SDR Forum Download Working Group developed this document with input from the Terminal and Network Architecture Working Group.
- ◆ DL-TIM: Timelines for Software Download for RF Reconfiguration: This document provides a presentation of the radio developmental activities around the world where radio software download is required or influenced. Included is a perspective on timeframes of related regulatory activities. An action plan of what specific deliverables are required of the Forum and of the identified external organizations is presented. Also provided is the timing of the critical "entry" points into the developmental activities for each of these organizations (both standards organizations and regulatory organizations) to ensure that radio software download is standardized and available in the marketplace in a timely manner. Commercial wireless is the focus area of current deliverables within this topic area.
- ◆ DL-REQ: Requirements for Software Download for RF Reconfiguration: This document presents specific requirements for protocols for downloading software to a software-defined radio (SDR) device for its reconfiguration. The SDR device could be a small handheld communication device such as a cell phone, a slightly larger wearable device such as a manpack, or an immobile networked device such as a wireless base station. The requirements specified in this document have purposely been made general enough to encompass software downloads to all of the above types of SDR devices. The SDR Forum intends to seek comments on the initial version of this document from relevant other organizations for consideration for a subsequent version of this requirements document.
- ◆ DL-GLO: Report on Global Radio Technology Development Organization Perspectives on Software Download for RF Reconfiguration: This document provides a summary of work in the area of software download and related security issues being performed by recognized Standards Development Organizations (SDOs), Partnership Projects (3GPP and 3GPP2), Technology Proponents, and other commercial organizations (such as the Open Mobile Alliance). The summary also includes organizations that represent public safety and other civil Government applications of SDR and organizations that represent military applications of SDR. However, commercial wireless is the focus of the current deliverables in this software download series of documents.

- ♦ DL-REG: Report on Global Regulatory Views on SDR and Software Download for RF Reconfiguration: This document provides an understanding of how regulatory activities around the world are poised to support SDR and in particular how these agencies are anticipating what may be required to facilitate the usage of radio software download. It is a document that in conjunction with the requirements is critical in the definition and specification of acceptable solutions. Commercial wireless is the focus area of current deliverables within this topic area.
- ♦ DL-SIN: Software Download for RF Reconfiguration Security and Integrity: This document is intended to include aspects related to ensuring security, integrity, and related items associated with software, firmware, or equivalent that is resident in the radio device after insertion via download or other means, either from original manufacturer or through subsequent actions. Commercial wireless is the focus area of current deliverables within this topic area.
- ♦ DL-SOL: Specifications of Common Solutions for Software Download for RF Reconfiguration: Consistent with the definition of radio software download outlined in the previous document, this document covers the relevant factors associated with the download and establishes substantive requirements of a technical or other nature that form the basis for the development of common globally standardized solutions. Commercial wireless is the focus area of current deliverables within this topic area.

The relationship of these documents is seen in the figure below. DL-DFN is the overarching document that provides a foundation for the remaining documents and drives their development. Documents DL-TIM, DL-REQ, DL-GLO, and DL-REG are parallel documents that provide the basis for further work in DL-SIN and DL-SOL. It is these latter two documents that are the ultimate goals of this series of SDR Forum documents on software download. As work on these documents progresses, certain documents such as DL-SIN and DL-SOL may be combined into a single document.



**Relationship of SDR Forum Software Download Documents**

## ATTACHMENT 2

### SDR FORUM REPORT ON ISSUES AND ACTIVITY IN THE AREA OF SECURITY FOR SOFTWARE DEFINED RADIO

#### EXECUTIVE SUMMARY

This report is the result of the Software Defined Radio Forum's long history of interaction with the United States Federal Communication Commission (FCC) on regulatory issues related to Software Defined Radio (SDR). In the FCC Report and Order on SDR dated September 13, 2001, the Commission declined "to set specific security or authentication requirements at this time because they could hinder the development of the technology used to provide such security and could have the potential to be unduly burdensome on manufacturers." However the Commission stated that "it is possible that we may have to specify more detailed security requirements at a later date as software defined radio technology develops." The Commission noted "the SDR Forum has indicated that it is continuing to develop methods for the security and authentication of radio software and that it will report its findings to the Commission." As anticipated by the FCC, the SDR Forum has prepared this report on industry measures to address these security concerns.

Although this report is relevant to the questions being asked by the United States Federal Communications Commission, the SDR Forum believes that the document may be of interest to other regulatory agencies around the world.

In the review of security issues and activities of a wide variety of external organizations, the SDR Forum has developed the following views:

- ◆ There is broad interest in wireless communications and the security aspects of wireless systems by many industry players, some of which are relatively new to wireless systems. This broad industry involvement stems from the continuing merger of communications, computing systems, and content providers. This broad activity in wireless communications systems and security involves not only the traditional wireless players, but also many new players who bring additional expertise in security issues to the wireless community.
- ◆ Many of the general security core technologies, including security techniques used for information content (e.g., credit card) and general wireless security techniques, appear to be applicable to the more specific case of security of SDR-based systems.
- ◆ There are ample market drivers to provide adequate incentives for the wireless communication industry to deploy security technologies including core technologies that were not initially developed for SDR but which are applicable to SDR..
- ◆ The necessary work on security specifically for SDR-capable devices is being done by industry today. Solutions for SDR security are forthcoming from industry and will likely be based on security mechanisms, protocols, and algorithms previously developed for other security applications.
- ◆ The SDR Forum will continue to stimulate this industry activity by being a focal point for software download for RF reconfiguration including the security aspects of software download.

This report supports the above views by providing an overview of the security challenge that is followed by a more detailed description of security threats. This is followed by a description of the ongoing activities in industry to mitigate these threats. In both the discussion of the threats and in

the discussion of the mitigating activities, the flow of the information is from the more general to the more specific; i.e., first there is a discussion of general communications security, followed by a discussion of wireless communication security, and then specific SDR security.

One section of the report is dedicated to the topic of market incentives for deployment of security measures for SDR. The SDR Forum is confident that the technology is present to solve the SDR security issues and that there is a strong market incentive to do so.

Finally, the report concludes with a synopsis of future work planned by the SDR Forum, including plans to work with the wireless industry and standards organizations on measures needed to mitigate security threats to SDR-based systems.

