Functional Requirements

IEEE Project 802.11

DRAFT
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Version 0.2

Dear reviewers -

This is the second version of the functional requirements document. It's version is 0.2. The goals for this version were:

1) To make the document more self consistent.
2) To neither add nor delete from the list of agreed functional requirements from the March mtg.
3) To keep the document as short as possible.
4) To clarify the concepts discussed at Irvine.

To accomplish this the following was done:
1) Fleshed out the definitions section to include some terms the rest of the document used but did not define. The definitions are not complete. I do believe they are self consistent and good enough to proceed with.

2) I have changed a couple of common terms to make the meaning of their concepts clearer. I fear that this may cause short term confusion - I also believe it will provide long term improvement in the quality of our discussions. In particular I have taken the liberty of changing BSA to BSS and ESA to ESS (stop! don't shoot that gun just yet). The discussions at Irvine were productive because we divorced the concept of Coordination Function from physical implementation. We realized that the basic building blocks of a wireless network are really centered around a CF concept instead of a geographical concept. Thus, the "A" (for area) in these terms is very misleading - the best suggestion was to use the word "set" instead. It makes sense when you read the updated definitions.

3) There was an attempt made to add a short paragraph to expand the intent of the bullet items in the functional requirements section of the document. It became apparent while writing these paragraphs that they did *not* help clarify the functional requirements. The paragraphs tended to stray from "what is required" into "how to do it". It was felt that this was not appropriate for a functional requirements list. With the improved definitions, much of the motivation for the verbiage was gone. The paragraphs were abandoned.

4) In some places I have inserted <TBD>. This happened when it was not clear what to say. Help is solicited to clean up the <TBD> places.

5) The functional requirements seemed to naturally group themselves, so they were ordered them to make the document easier to read. The order is NOT intended to imply any relative importance between bullet items.

Please bring all comments to the Leiden meeting, preferably in written form, even better if they are machine readable (by a PC, the most common format seems to be Win Word for either MAC or PC). You can also Email comments to me - but other than read them, I probably won't be able to do much with them between now and the Leiden meeting.

I you have questions re this document, Email is the best way to access me. If you can not access the internet, try calling me. Just be aware that Email is more likely to get a considered response from me, the phone call is unlikely to catch me in the office - but you are welcome to try.

Dave Bagby - editor.
Email: david.bagby@Sun.com
Office: (415) 336-1631

Introduction:

This document contains the agreed upon definitions and functional requirements for 802.11.

Definitions:

The following definitions are used within this document:

MAC Service Data Unit (MSDU): The MAC Service Data Unit is information that is delivered as a unit between MAC service access points.

Wireless Media (WM): The media used to implement a wireless LAN.

Station (STA): Any *device* which contains an 802.11 conformant MAC and PHY interface to the wireless media.

Coordination function (CF): That logical function which determines *when* a station transmits and receives via the WM.

Distributed CF (DCF): A class of possible CFs where the CF logic is active in every STA at any given time.

Point CF (PCF): A class of possible CFs where the CF logic is active in only one STA at any given time.

Basic Service Set (BSS): A set of STAs controlled by a common CF.

Extended Service Set (ESS): A set of interconnected BSSs which appear as a single BSS to LLC.

Distribution System (DS): A logical system used to interconnect a set of BSSs to create an ESS.

Distribution System Media (DSM): The media used by a DS for BSS interconnections.

Distribution System Services (DSS): The set of services provided by the DS which enable the MAC to transport MDSUs between BSSs within an ESS.

Access Point (AP): Any STA whose MAC invokes DSS.

Registration: <TBD>
<Ugly draft: The process by which a prospective user of the network authenticates himself to the network and exchanges operational parameters so as to participate in network services.>

Authentication: <TBD>
<Ugly Draft: The mathematical process invoked by ? to prove I am who I say I am. Who am I? the user of a STA? How do we say this since a user does not talk to a MAC/PHY, only other non-people layers do...>

Functional requirements:

Externally Imposed requirements:

Documents which contain functional requirements that are hereby incorporated as 802.11 functional requirements:

802 Functional Requirements (document number P802-91/152).

802.11 PAR. <need PAR doc number here>

The 802.11 PAR supersedes the 802 Functional Requirements (P802-91/152) where they conflict.

General requirements:

The primary service provided by 802.11 is to deliver MSDU's between LLCs.

Continuity of service to the LLC layers within an ESS will be supported.

The Mac must accommodate *any* PHY transmission rate between 1 and 20 Mbs.

The 802.11 MAC and PHY will support the applications described in the 802.11 Market Requirements Document.

Any function or service unique to wireless networks will be handled within the 802.11 standard.

802.11 will support multicast services.

The standard will support network management services.

Data Service Types:

802.11 will provide two classes of data gram service:
1) An *Asynchronous* packet delivery service.
2) A *Time-bounded* packet delivery service.

All 802.11 implementations will support the *Asynchronous* class service.

Stations using the *Asynchronous* and/or *Time-bounded* service must coexist within the same BSS.

Coordination Functions:

All 802.11 implementations will support a common default Coordination Function.

There will be a method for dynamically switching from the default Coordination Function and any other defined Coordination Function.

A single MAC shall be used to support all Coordination Functions.

There shall be mechanisms defined to resolve media use conflicts.

Coordination Functions may be either DCF or PCF in nature.

The following combinations of Coordination Functions and network types must be supported:

Network Type	CF Class:	
	DCF	PCF
BSS	Supported	Supported
ESS		Supported

MAC / PHY interface:

A single MAC will be used to support multiple PHYs.

A single MAC/PHY interface will be defined.

If the MAC/PHY interface is exposed, a conformant implementation must adhere to the defined MAC/PHY interface.

Security:

The standard shall support registration services.

The standard shall support authentication services.

Additional mechanisms beyond 802.10 shall be provided to address security issues unique to 802.11.