Collected comments on Section 2 of draft standard D1
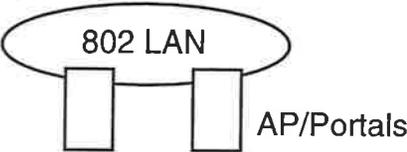
2	Rick White	E	Quality of figures in all of Section 2 is poor and needs to be improved.	
2	Simon Black	E	Move tutorial on IEEE 802.11 architecture to an informative annex.	It is unusual for a standard to contain so much tutorial information. In general the information in section 2 is useful, I would however question its place in the standard.
2	David Bagby	T		See imbeded comments and annotations
2	Rick White	T	Remove Editor's comments	
2.0	Mahany	E	Use consistency in BSSID Vs BSS ID, and ESSID Vs ESS ID. terminology	Readability
2.1.1.1	Bob O'Hara	E	Replace the last sentence with "In the general case, the STA is a message destination, not a fixed location."	Current sentence is tortured usage.
2.1.1.2	David Bagby	E	Because of limitations on~~of~~ wireless PHY range_s, wireless LANs intended to cover reasonable geographic distances must be built from basic coverage building blocks.	See imbeded comments and annotations
2.1.1.2	Geiger	E	Remove items a) and b)	a). Wired networks do have limitations to point-to-point connection ranges, as a matter of fact, please tell me one that doesn't. The point-to-point limitations in wired networks provide control over BER performance and also access delay. This subject will be addressed later in this ballot. b). I can think of at least 20 different PHYs which provide a shared medium: i.e. SONET, DS1,DS2, etc.
2.1.1.2	Bob O'Hara	T	delete a) and b) from the list	These characteristics are NOT different than a wired medium.
2.1.1.2	C. Thomas Baumgartner	t	add f) The assumption normally made that every STA can hear every other STA is not valid	This is one of the major differences between wireless and wired which has major implications
2.1.1.2	Fischer, Mike.	T	section headingÑeither ÒThe Medium Impacts . . .Ó or ÒThe Media Impact . . .Ó item (a)Ñchange ÒlimitedÓ to ÒshorterÓ and change ÒrangesÓ to Òranges than wired LANsÓ item (b)Ñchange ÒmediumÓ to Òmedium that has neither absolute nor readily observable boundaries outside of which stations with conformant PHY receivers are known to be unable to receive the network frames. item (d)Ñreplace with ÒExhibit significantly higher bit error rates than wired PHYsÓ	clarity, correct attribution of the Òless reliableÓ to data reliability reduction, not MTBF reduction
2.1.1.2	Rick White	T	802.11 PHYs lack full connectivity even within a BSS.	This is a fundamental problem with RF LANs.
2.1.1.3	CHRIS ZEGELIN		NEED A STATEMENT AS TO HOW THE PROTOCOL EFFECTS POWER CONSUMPTION IN A MOBILE BATTERY POWERED UNIT.	THERE IS NO INDICATION AS TO THE IMPORTANCE OF POWER MANAGEMENT BUILT INTO THE PROTOCOL.
2.1.1.3	Greg Ennis	T	Add a third paragraph: "Another important aspect of mobile stations is that they will often be battery-powered and hence power management is an important consideration. For example, it cannot be presumed that a station's receiver will always be powered on. "	This is an important impact of handling mobile stations.
2.1.1.4	David Bagby	E	802.11 is required to appear to higher layers (LLC) as an ~~current~~ 802 style LAN. This requires that the 802.11 network handle station mobility within the MAC layer. To meet reliability assumptions (that LLC makes about lower layers), it is necessary for 802.11 to incorporate functionality which is untraditional for other 802 MAC layers.	See imbeded comments and annotations
2.1.1.4	Rick White	E	Should include a list of some of the functionality which is untraditional for MAC layers.	Will help with the explanation

Section	Name	Type	Comment	Rationale
2.1.1.4	Fischer, Mike.	T	change Òreliability assumptionsÓ to Òreliability and security assumptionsÓ	The same logic aplies to the untraditional approach of including some security features in the MAC as for reliabilityÐrelated differences with tradition.
2.10	CHRIS ZEGELIN		SERVICE PRIMITIVES ARE THE INTERCONNECTS BETWEEN THE MAC LAYER AND THE PHY LAYER. THIS HAS NOT BEEN CLEARLY STATED.	
2.10	Bob O'Hara	E	Insert "of" between "are" and "four" in the second paragraph	Proper usage.
2.10	David Bagby	T		See imbeded comments and annotations
2.2	CHRIS ZEGELIN		'BSS' DEFINITION USES THE UNDEFINED CONCEPT OF 'CF'. 'CF' IS DEFINED MUCH LATER. COPY 'CF' DEFINITION INTO THIS SECTION.	
2.2	A. Bolea	E		There are several obvious misspellings in figures 2-1,2,3,4&6. In addition, the font used is hard to read.
2.2	Bob O'Hara	E	Match STA definition to revised wording in section 1.2	consistency (see 1.2 comment about STA definition)
2.2	David Bagby	E	It is useful to think of the ovals used to depict a BSS as the coverage area within which the member stations of the BSS can remain in communication. (The concept of area can lead one astray, and while not precise, is often good enough.) If a station moves out of it's BSS coverage area, it can no longer directly communicate with other members of the BSS	See imbeded comments and annotations
2.2	C Heide	T	last paragraph of section: "It is useful to think ... can remain in communication with all other member stations. The concept ... no longer communicate with all other members of the BSS."	This is required to remain consistent with the drawing. In the drawing the BSS's cover only where the two member stations can communicate with each other, not where the coverage of each individual station extends. This implies that the BSS only covers where all members can communicate with al other members, not just where any two can communicate with each other, which is what the existing text implies.
2.2	Rick White	T	Include some descriptions of possible physical implementations.	Section 2.2 is that it are very confusing. It may require some descriptions of possible physical implementations. The architecture components area have been very confusing to voting members of the committee. This is evident from the discussion on wireless distribution systems preceding the Nov. 94 meeting.
2.2	Rick White	T	Need to define what is meant by the coverage of a BSS	Last sentence of 2nd paragraph after Figure 2-1 - What defines the coverage of a BSS? In an ad hoc network is it area in which all STAs can communication with one another or does a station have to communicate with only one other member of the BSS? In an infrastructure network is it the coverage of the AP?
2.2.1	Bob O'Hara	E	replace "can" with "may" in first sentence	Proper standard language.
2.2.1	Bob O'Hara	T	replace "close enough to form a direct connection" with " able to communicate directly"	Proximity does not imply ability to connect.
2.2.1	Rick White	T	Define that an Independent BSS has no connection to any other 802.11 LAN or a distribution system.	Clarifies what is meant by Independent BSS.
2.2.1	Rick White	T	Need to define if all STAs in an independent BSS must communicate with one another	Do all STAs of an Independent BSS have to be able to communicate with all other members of the BSS? If so, how does a station know what other STAs make up the IBSS.
2.2.1	Rick White	T	Need to clarify the definition of a IBBS	Does a IBBS contain an AP or are there two different types of IBSSs, one containing a AP and another not containing an AP?
2.2.1.1	Geiger	E	Title should be **STA to BSS Association is Dynamic**	Closer to the subject in the text.
2.2.1.1	Rick White	T	An AP does not have to be part of an infrastructure network.	A standalone AP could be used for range extension.

2.2.2	CHRIS ZEGELIN		ESS IS USED BUT NOT DEFINED IN THIS SECTION. COPY THE ESS DEFINITION INTO THIS SECTION.	
2.2.2	CHRIS ZEGELIN		AP HAS A SUPERSET OF STA FUNCTIONALITY. THE WAY THE WORDING IS, IMPLIES THAT AN AP CAN BE MADE FROM A STA, WITH THE DS SERVICES BOLTED ON THE BACK.	
2.2.2	Bob O'Hara	E	insert the word "communication" between "station" and "distance" in the first sentence.	More informative.
2.2.2	Bob O'Hara	E	insert "a" between "is" and "key" in the sentence beginning "Recognizing that the two media..."	Proper usage.
2.2.2	David Bagby	E	. The 802.11 LAN architecture is specified independently of the physical characteristics of any specific ~~architectural~~ implementation.	See imbeded comments and annotations
2.2.2	David Bagby	E	**Access Point** (AP): Any entity that has STA functionality and provides access to the DS. An AP is a STA which provides access to the DS by providing DS services in addition to <u>acting as a</u> Station ~~Services~~.	See imbeded comments and annotations
2.2.2	David Bagby	T	PHY limitations determine the direct station to station distance which can be supported. For some networks this <u>distance</u>~~limitation~~ is sufficient, other networks require increased coverage. Instead of existing independently, a BSS may also form a component of an extended form of ~~an 802.11~~ network which is built with multiple BSSs. The architectural component used to interconnect BSSs is the Distribution System. **Distribution System** (DS): A system used to interconnect a set of BSSs to create an ESS. **Distribution System Medium** (DSM): The medium used by a DS (for <u>AP</u>~~BSS~~ interconnections).	See imbeded comments and annotations
2.2.2	Geiger	T	In figure 2-4 the <u>red</u>	Will the standard be in color?
2.2.2	Rick White	T	It must be pointed out in that the simplest form of a distribution system in an 802.11 LAN is an AP that receives traffic from one station and relays it to another STA in the same BSS.	In my mind this is a form of an Independent BSS. Need to add figure showing three STAs in a BSS, one being an AP, that is not connected to an external DS (which is connected to another BSS).
2.2.2, 7th paragraph	Fischer, Mike.	T	change Ò. . . seamless integration of multiple BSSs.Ó to Ò. . . seamless interconnection of multiple BSSes into a single logical network.Ó	ÒintegrationÓ is what is done with other, wired LANs, not between BSSes.
2.2.2, 9th paragraph	Fischer, Mike.	T	add at end of sentence Ò for stations in the same BSS that do not have such access without using the WM.Ó	The key issue for ÒAPÓ is the provision of access <u>via the WM</u> to stations that lack any other communication path that gets their transmissions to the DSM.
2.2.2, last paragraph	Fischer, Mike.	T	add at end of sentence Ò and the addresses used by an AP for communication on the WM and on the DSM are not necessarily the same.Ó	clarity

2.2.2.1	CHRIS ZEGELIN		ESS DEFINITION DOESN'T SEEM RIGHT	
2.2.2.2	John Hayes	E/T	TBD	Architectural description of WDS.
2.2.3	CHRIS ZEGELIN		INTENSITY MAP - COLOR VS. SIGNAL STRENGTH IS NOT DEFINED	
2.2.3	A. Bolea	E		Figure 2-4 looses a lot of meaning when not in color, especially when the text refers to "red blocks in ...". I recommend removing the figure. Figure 2-5 and associated text does not add to the understanding of the area concepts. I recommend to remove it.
2.2.3	Bob O'Hara	E	replace parenthetical clause at end of first paragraph with "(as moving objects may impact station to station propagation)"	not all objects will affect propagation.
2.2.3	Bob O'Hara	E	replace "door way" with "doorway" and "snap shot" with "snapshot".	proper usage
2.2.3	C Heide	E	second paragraph on page 15: "Further description ... figure 2-5, to which BSS do stations 6 and 7 belong?"	dangling participle
2.2.3	Jon Rosdahl	E	...attempting to describe co-located coverage areas. ...	Misspelled word "collacated on page 15 just above the figure.
2.2.3	Mahany	E	Figure 2-4: Replace "red" with dark	Color Blindness
2.2.3	Mark Demange	e	Add scale to figure or delete (see rationale).	Figure serves no purpose without a scale to distinguish what the different shades represent. If, for example the difference between black and white were 1dB then the picture would tell me that the signal strength of the environment is relatively constant in a given area. This is clearly not the case and we should not allow this much interpretation. If no scale is given then we should delete the figure and associated text so that no misinterpretation is made.
2.2.3	Renfro	E	Will figure 2-4 be published in color? Red blocks referenced in text. I would suggest we delete since it doesn't add much to interoperability.	
2.2.3	Rick White	E	In Figure 2-5, is STA 7 intended to be an AP? If not, the size of the box should be reduced.	
2.2.3	David Bagby	T	**Basic Service Area** (BSA): The <u>conceptual</u> area within which members of a BSS can communicate. **Extended Service Area** (ESA): The <u>conceptual</u> area within which members of an ESS can communicate. An ESA is larger than or equal to a BSA.	See imbeded comments and annotations
2.2.3	Rick White	T	Figure 2-4 requires a legend to indication what the different colors represent.	
2.2.3, last paragraph	Fischer, Mike.	T	add at end of sentence Ò and may involve multiple, disjoint, physical BSAs and/or sites.Ó	The ESA is not only larger than or equal to the BSA, the ESA can have nonÐcontiguous coverage (by design, not just due to shadowing and signal interference) due to geographic separation of the BSAs.
2.2.4	CHRIS ZEGELIN		NEED SOME TEXT TO DESCRIBE PROBLEMS WITH ROUTERS IN THE DS	PEOPLE WHO READ THE SPEC NEED TO KNOW THAT WE ARE AWARE OF THE PROBLEM
2.2.4	Bob O'Hara	E	delete paragraph after figure 2-6	redundant
2.2.4	C Heide	E	first paragraph should use ":" not ";".	bad grammar
2.2.4	Rick White	E	The concept of a distribution System is very confusing and must be clarified.	The whole concept of a distribution System is very confusing when divorced from a physical implementation but is used to show physical connection between BSSs.

Section	Name	T/E	Comment	Rationale
2.2.4	Bob O'Hara	T	replace "a traditional wired" with "another 802" in the second paragraph	consistent with revised definition of integration (see comment on section 1.2, definition of "Integration").
2.2.4	Greg Ennis	T	Add the following at the end of the section: "Such an AP which is acting simultaneously as a portal to a distribution system which consists of a standard 802 LAN is depicted in the following figure: [Figure: ellipse labeled "802 LAN" with two boxes below labeled "AP/Portals"]	Clarifies the Portal concept in the context of 802-standard distribution systems.
2.2.4	Rick White	T	Is it not true that the DS is probably an 802.x LAN? If so, than does that mean that an AP would contain a portal since a DS is defined as "a system used to interconnect a set of BSSs to create an ESS. Does it also follow that if the DS is an 802.x LAN then other non-802.1 devices could be connected to it. If this is not true then it must be stated that only APs can connect to a DS and if the DS is shared with other non-802.11 devices, the AP must contain a portal	
2.2.4.1	Bob O'Hara	E	replace beggining of third paragraph with "Bridges or bridge-like devices also may be used..."	Proper standard language
2.2.4.1	Bob O'Hara	E	replace "media" with "medium" in last paragraph	Proper usage.
2.2.4.1	Bob O'Hara	E	insert comma following "functionality" in last sentence	Proper usage.
2.2.4.1	C Heide	E	last paragraph on page 16 should use ":" not ";"	bad grammar
2.2.4.1	David Bagby	T	Physically, a Portal may, or may not, include bridging or routing functionality depending upon the physical implementation of the DS and the wired LAN.	See imbeded comments and annotations
2.3	Bob O'Hara	E	delete ".x" after "802" in first paragraph	Proper usage.
2.3	Bob O'Hara	E	replace "interests represented by members of 802.11" with "requirements identified during the development of the standard" in the last sentence of the first paragraph.	Prudence.
2.3	Bob O'Hara	E	replace "decided not to specify" with "does not specify" in the second paragraph.	Proper standard language
2.3	C Heide	E	second paragraph page 18 should use ":" not ";"	bad grammar
2.3	David Bagby	E	This generality allows the 802.11 architecture to satisfy the diverse interests represented by the members of 802.11.	See imbeded comments and annotations
2.3	Jim Panian	E	The 802.11 architectural services need to be tied to the state machine diagrams.	Currently, the state machine diagrams show a "Mac Data Service" and a "Mac Management Service", and none of the services listed in 2.3.
2.3	Jim Panian	E	Add compression to the list of 802.11 architectural services.	Compression is not listed as an 802.11 architectural service.
2.3	Jon Rosdahl	E	...instead 802.11 specifies services...	2nd paragraph . "Services" has an underline code included, should be removed.
2.3	Mahany	E	1st paragraph, last sentence: replace "diverse interests represented by members of 802.11 with "diverse set of applications served by 802.11 LANs".	The standard serves the end user.
2.3	Greg Ennis	T	Add "Asynchronous Data Transfer", "Power Management", "Contention Free Connection Management", and "Time Bounded Data Transfer" to the list of the "complete" set of 802.11 services.	List is not complete
2.3	Rick White	T	Each architectural service must be defined in this section	
2.3, last paragraph	Fischer, Mike.	T	Either define (or add an example of) Ònetwork layer mobility approachesÓ or change the sentence to use a term already defined in this document.	understandability by the target audience
2.3, next to last paragraph	Fischer, Mike.	E	change ÒchoseÓ to ÒchoosesÓ	correct tense

2.3.1	CHRIS ZEGELIN		STATION SERVICES ARE MORE THAN THE SUBSET LISTED. THAT OR THE DEFINITION OF SS IS WRONG.	
2.3.1	C Heide	E	"including APs, as APs include station functionality)."	incorrect use of ";" again
2.3.1	David Bagby	T	The Station Services are present in every 802.11 station (including APs; as APs include station functionality). Station Services are specified for use by MAC layer entities. All conformant stations provide Station Services. ~~In the figures, dots will represent Station Services.~~ deleted because the figures don't use dots.[DB12]	See imbeded comments and annotations

2.3.1	David Bagby	T	The Station Services subset is:
			
			    a) Authentication
			    b) Deauthentication
			    c~~b~~) Privacy
				See imbeded comments and annotations

2.3.2	CHRIS ZEGELIN		THE DEFINITION OF DSS IS WRONG.	
2.3.2	Bob O'Hara	E	rplace "know" with "known" in first sentence	Proper usage.
2.3.2	David Bagby	E	The services provided by the DS are known as the Distribution Systems Services (DSS).	See imbeded comments and annotations
2.3.2	Mark Demange	e	First sentence - "known as "	
2.3.3	Mark Demange	e	Paragraph 5 sentence 1 replace "instantiations" with "instances"	"instantiations" is not a word in my dictionary - Webster's Ninth Collegiate Dictionary
2.3.3	McKown	E	para 3: it's addresses > its addresses	it's = it is; the possessive pronoun is its
2.3.3	Rick White	T	Include a diagram of the 802.11 802 48-bit address.	Help with understanding of the addressing. Does not require reader to get another standard.

2.3; also 1.2 definition of Òinfrastructure Ó2.4.1.1, 6th paragraph; 2.4.2.2, 3rd paragraph; 2.4.2.3, 3rd paragraph; 2.7	Fischer, Mike.	T MAJOR ISSUE	The standard needs to specify the message formats used to communicate (intraÐESS) for the provision of (at least) association, reassociation, integration, and distribution. This requires enough words (and pictures), and impacts enough places in the document, that I have not attempted to put specific text in this box of the table. A set of changes adequate to overcome my ÒnoÓ vote on this subject appear in document 95/17. The bulk of the message format information will end up in section 2.7.	The fundamental purpose of this standard is to provide a basis for mixedÐvendor interoperability across each of the exposed interfaces in the subject specification. The WM is one such exposed interface, and is covered in considerable detail in the D1 draft. The DSM is another such exposed interface, but the degree of abstraction of distributionÐrelated definitions makes interoperable distribution (even in simple cases such as multiple vendorsÕ APs attached to the same 802.3 wire) impossible without additional definitions. Even the current draft states that there is an exposed interface between access points and the distribution system (even if not stated very well, see above). The concept that 802.11 should Ònot specify specific DS implementationsÓ remains valid. What is needed is the definition of specific frame payloads, that can be delivered over 802Ðstyle LANs, which shall be used for interÐAP communication (called an IAPP in some submissions to this working group) to establish the necessary information about associations/reassociations to support mobility transitions; and for APÐto/fromÐportal communication to support integration of other 802 wired LANs. In 2.4.1.1, 6th paragraph is states that Òall 802.11 is required to do is to provide the DS with enough information . . .Ó This is generally correct, but the support of reassociation for BSSÐtransition mobility, and the preservation of Òauthentification Ó across such transitions (even when using a wireless distribution system), require the directed exchange of information between the DSS at one AP and the DSS at another AP in the same ESS (among other intraÐESS exchanges between MAC LMEs over the DSM). How the DS gets the messages containing this information between APs may be external to this standard, but the formats of those messages must be defined or users will have to outfit an entire ESS with APs from a single vendor (or deÐfacto interoperabiity group of vendors operating outside of the 802 standards process), even if they can procure nonÐAP stations from multiple sources. The other alternative is to remove mobility support and the ESS concept from the standard. This not only leaves aspects of the PAR unaddressed, but would yield a standard that fails to meet most usersÕ needs ÐÐ at the ranges discussed for several of the PHYs almost any potential customer for more than about 10 or 15 stations would probably need to deploy a multiÐAP ESS.
2.4	David Bagby	E	The services are presented in an order designed to help build an understanding of the operation of an 802.11 ESS network.	See imbeded comments and annotations
2.4	Geiger	E	Five of the services.....delivery between stations. replace with delivery within a Distribution System.	I assume that MSDU are always exchanged between stations, what else is there. Be consistent with section 2.4.1.1 and 2.3.2

2.4	Jim Panian	E	Add text describing how control and contention free messages flow through the state machines.	What path do control and contention free messages take (MAC data path or MAC management service path)?
2.4	Mark Demange	e	Paragraph 4 and 5: Description of servicing of data and MAC management messages are described. Control messages are referenced in paragraph 4 with no corresponding high level description of the service path. Add description of servicing of control messages.	
2.4	Rick White	E	Paragraph 4 specifies three types of messages, Data, Management, & Control. Section 4 specifies, Asynchronous Data, Management, & Control.	We should be consistent.
2.4	John Hayes	E/T	TBD	Need an overview of wireless distribution services. We have made changes in the frame formats to allow for this feature, we had better describe it somewhere.
2.4.1.1	CHRIS ZEGELIN		DISTRIBUTION DOES NOT NEED ASSOCIATION INFORMATION TO DELIVER AN MSDU FROM A STA TO THE DS. IT DOES NEED ASSOCIATION INFORMATION TO DELIVER FROM THE DS TO A STA. THE STATEMENTS ARE SLIGHTLY WRONG.	
2.4.1.1 2.4.1.2 2.4.2 2.4.2.3 2.4.2.4	Geiger	E	"Distribution Service" change to ...Distribution service or define the difference between Distribution Service and Distribution services. This holds true in sections regarding Association, Reassociation, Disassociation	Distribution Service gets confused with Distribution System, don't capitalize service and be consistent with other service descriptions
2.4.1.1	Jon Rosdahl	E	How the message is distributed...	5th paragraph. "How" has an underline code included. Shou be removed.
2.4.1.1	McKown	E	para 2: delete "conceptually"	messages don't think
2.4.1.1	Rick White	E	The "input" and "output" AP should be changed to reflect the terminology in Section 4 "To/From DS"	We should be consistent.
2.4.1.1	David Bagby	T	In either example, the Distribution service was logically invoked. Whether the message actually had to traverse the physical DSM or not is a DS implementation matter and not specified by 802.11. While 802.11 does not specify DS implementations, it does recognize and support the use of the WM as the DSM. This is specifically supported by the 802.11 frame formats. (Refer to section 4 for details).	See imbeded comments and annotations
2.4.1.1	N. Silberman	T	needs definition of interconnectivity within the Distribution System in order to allow interoperabilty between access points	Without this definition of connectivity between APs the Distribution system is useless as an interoperable system and left to proprietary or incompatible implementations.
2.4.1.1.	P. Brenner	T	The IAPP (Inter AP Protocol) is defined in section xxx	An Inter-AP_Protocol MUST be defined, otherwise the users will not be able to use different vendors APs in one single ESS.
2.4.1.2	Mark Demange	e	Rewrite for clarification	This needs to be reworded since I'm not sure what it is telling me.
2.4.1.2	N. Silberman	T	Remove the definition of Portal	If the statement starting with "The details of an integration service... is true then the definition of a portal just confuses the issues.
2.4.1.2, 3rd paragraph	Fischer, Mike.	T	Add statement to the effect that: Òintegration service may use the 802.11 MAC for message delivery in cases that the DSM and WM are the same.Ó Also, add ÒrefragmentationÓ to the parenthesized list in the next-to-last sentence.	completeness

Section	Commenter	Type	Comment	Resolution / Comment
2.4.1.2, last paragraph	Fischer, Mike.	T MAJOR ISSUE	The statement that details of an integration service are dependent on a DS implementation are correct. However, this does not mean that the subject should be ignored. Just as with DSSÐtoÐDSS messages across the exposed distribution system interface discussed in relation to 2.3, the ISÐtoÐDSS messages need to be specified to permit portals from one vendor to work on the same distribution system as APs from another vendor Ñ the alternative is to eliminate the portal as a separate functional element and make Integration a service that must take place on an AP (which I would expect to be a common implementation approach, but should not be required as the only practical approach). What should be done is the addition of specification of the functional characteristics of a portal, and the message contents that must be exchanged with DSS. These characteristics primarily concern address resolution (to/from the 802.11 address space, independent of the other sideÕs address space, frame size limitations on the DSM relative to the integrated LAN (the LANÕs limitations are outside our part of the problem and the DSM relative to the WM is covered in the existing draft), access to the DSS mechanism to resolve mobility transitions, and the point at which WEP ends (especially relevant when the ESS uses WEP and the integrated LAN uses a different 802.10 mechanism). Acceptable words to describe these functions appear in document 95/17.	see discussion in column to left
2.4.2	C. Heide	T	Throughout the section the word "mobile" should not describe the word STA: page 23, lines 12, 15, 19, and 29; page 24, line 1.	All STAs are required to adhere to the association services not just mobile ones.
2.4.2, 1.1, 3.2, 5.8	Jim Panian	T	Provide MAC service primitives to facilitate the three distribution system services: • Association • Reassociation • Disassociation - including the detection of link outage The above mentioned MAC service primitives will feed into the Association, Reassociation, and Disassocation services in the state machine descriptions as well.	Enough detail must be provided by the 802.11 standard to facilitate hand-off mechanisms on the distribution system.
2.4.2.1	David Bagby	E	c) *ESS-transition:* This type is defined as station movement from a Basic Service Set in one Extended Service Set to a Basic Service Set in an independent Extended Service Set. This case is supported only in the sense that the Station can move. Maintenance of upper layer connections ~~support by 802.11~~ cannot be guaranteed by 802.11, in fact disruption of service is likely to occur.	See imbeded comments and annotations
2.4.2.1	Renfro	E	Under ESS-transition, change 'support by 802.11' to 'supported by 802.11'	
2.4.2.1	C. Heide	T	Item (a), item (2), replace "e.g." with "i.e."	movement within PHY range of the communicating stations is within a BSA be definition - within a BSA is not an example f such movement.
2.4.2.1 (c)	Fischer, Mike.	E	change Òupper layer connectionsÓ to Ò802.2 (or other upper layer) connectionsÓ	politics Ñ this is an 802 standard, so LLC is assumed to be 802.2 unless we have reason to specify otherwise
2.4.2.2	CHRIS ZEGELIN		ASSOCIATION IS REALLY THE ACT OF INFORMING THE DS HOW TO ROUTE A MESSAGE FROM THE DS TO THE MOBILE UNIT. THE TEXT IMPLIES THE OPPOSITE.	
2.4.2.2	CHRIS ZEGELIN		THE CONCEPT OF A STA BEING CONNECTED TO TWO AP'S, EACH IN A DIFFERENT ESS IS PRECLUDED. REMOVE THE SENTENCE THAT SAYS THAT A STA CAN ONLY BE ATTACHED TO A SINGLE ESS.	MAKING IT CLEARER HOW THE MESSAGE ROUTING ACTUALLY WORKS IMPLIES THAT ITS OK TO BE CONNECTED TO TWO OR MORE SEPARATE ESS'S. PART OF THIS CONCEPT COMES FROM BEING SIMULTANEOUSLY PART OF AN AD HOC NETWORK AND AN INFRASTRUCTURE NETWORK WITH DIFFERENT ESS'S

2.4.2.2	A. Bolea	E	"see section 7.xx" should be reworded as "see section 7.1.3"	
2.4.2.2	C. Heide	E	replace sixth paragraph with "A STA learns what APs are present, then invokes the Association Service to request to establish an association."	As it is I understood this sentence to say that something about the association service facilitates the STA learning what APs are present.
2.4.2.2	David Bagby	E	A station learns what APs are present and then requests to establish an association by invoking the Association Service.	See imbeded comments and annotations
2.4.2.2	Geiger	E	Section 7.xx on scanning	Resolve xx
2.4.2.2	Glen Sherwood	E	Change reference to "section 7.xx" in sixth paragraph, to appropriate section.	Does not properly reference the section on scanning.
2.4.2.2	Joe Kubler	E	7.xx -> 7.1.3	
2.4.2.2	Jon Rosdahl	E	...For the details of how a station learns about what APs are present see section 7.1.3 on scanning.	Missing 7.1.3 for the reference.
2.4.2.2	Lewis	E	replace 7.xx with appropriate section	
2.4.2.2	Mark Demange	e	Paragraph 8 "see section 7.XX on" should have the proper cross reference.	
2.4.2.2	MLT	E	resolve 7.xx scanning reference with 7.1.3	
2.4.2.2	C. Heide	T	To the end of the first sentence of the fourth paragraph which begins "At any given instance ...", add the clause "within an ESS".	Nothing can prevent a STA from becoming associated with two APs in different ESSs, as the APs cannot communicate with each other. The STA may think it is only associated in one places, but the APs don't know that (until perhaps some association timer expires on one of them).
2.4.2.2	Lewis	T	Delete "at any given instant a mobile STA may be associated with no more than one AP."	This is not necessarliy true. and is dependent upon the handoff mechanisms utilized by the DS. During a roaming handoff, a STA reassociates with a new AP, and an infinitely instantanous handoff may not be possible. This results in brief instances where one of two possible conditions can exists: the mobile station may be associated with no APs, or with 2 APs until the handoff within the DS is completed. Since the mechanism of disasociation with the old AP is not defined in the standatd, and is implied to be a function of the DS, this statement places undo restirctions on the functionality of the DS.
2.4.2.2	Rick White	T	Paragraph 8: Define how an STA determines what APs are present and determine which to use.	Paragraph 8: There is no information in Section 7 that defines how an STA determines what APs are present and determine which to use. This must be defined.
2.4.2.2, next to last paragraph	Fischer, Mike.	E	change 7.xx to 7.1.3	correct forward reference
2.4.2.2.	Mahany	T	Second to last sentence replace 7.xx with appropriate reference (scanning)	Omission
2.4.2.3	Jim Panian	E	Specify the details behind the reassociation procedure.	How is a hand-off handled with reassociation? When a mobile roams, does it perform the following order of events? • find a new AP • pre-Authenticate with new AP (optional) • privacy exchange with new AP • disassociate with old AP • reassociate providing MAC address of old AP + all information negotiated with old AP