

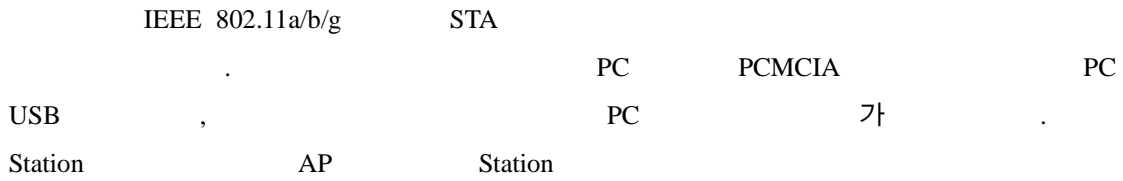
Station ION

: IEEE 802.11a/b/g
(IEEE 802.11a Wireless LAN Interoperability and WPA)

2004. 12. 7 ~ 2004. 12. 9

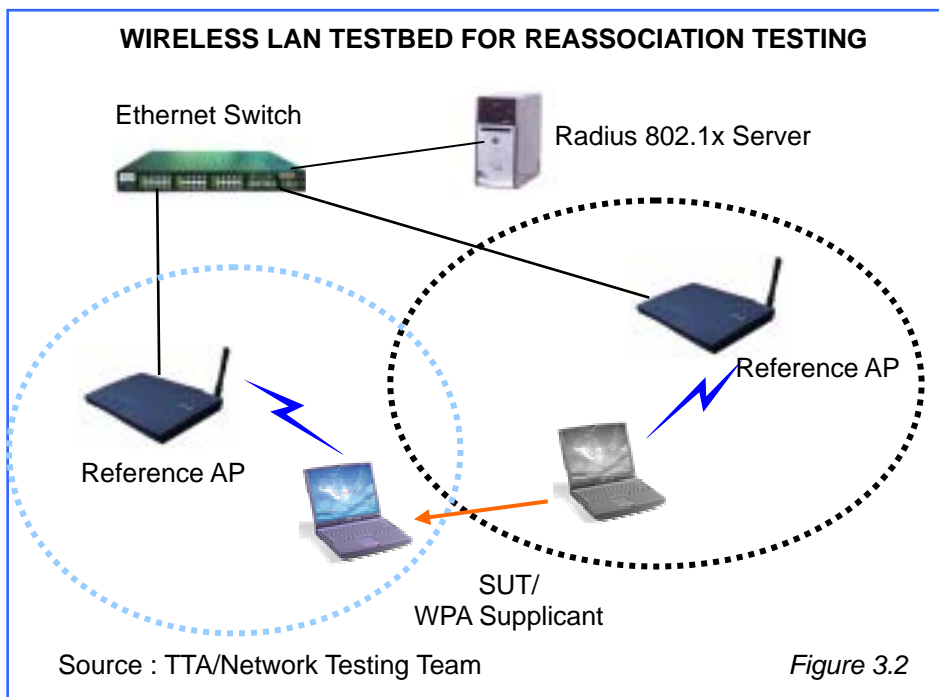
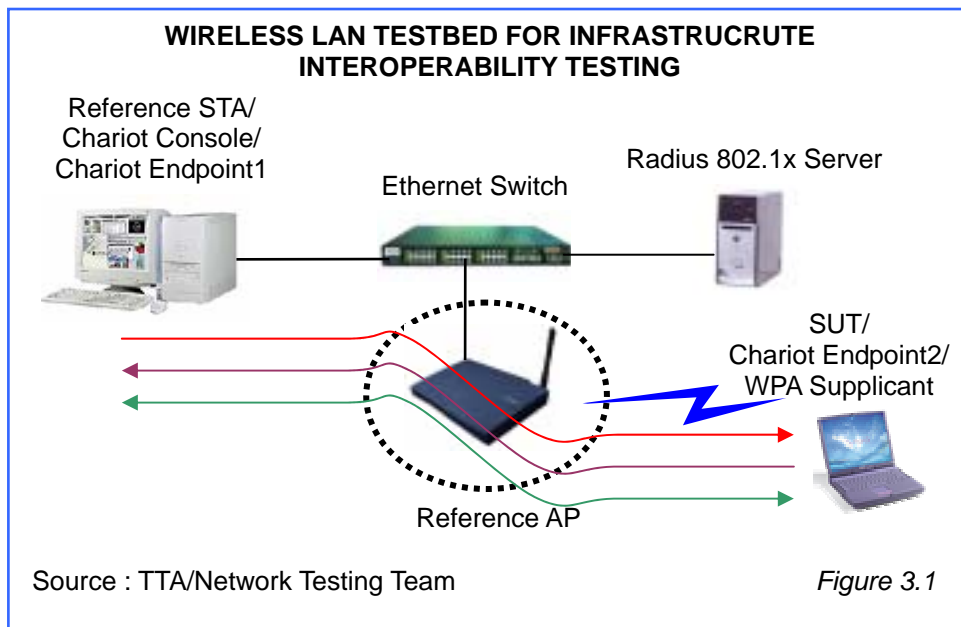
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1. Introduction

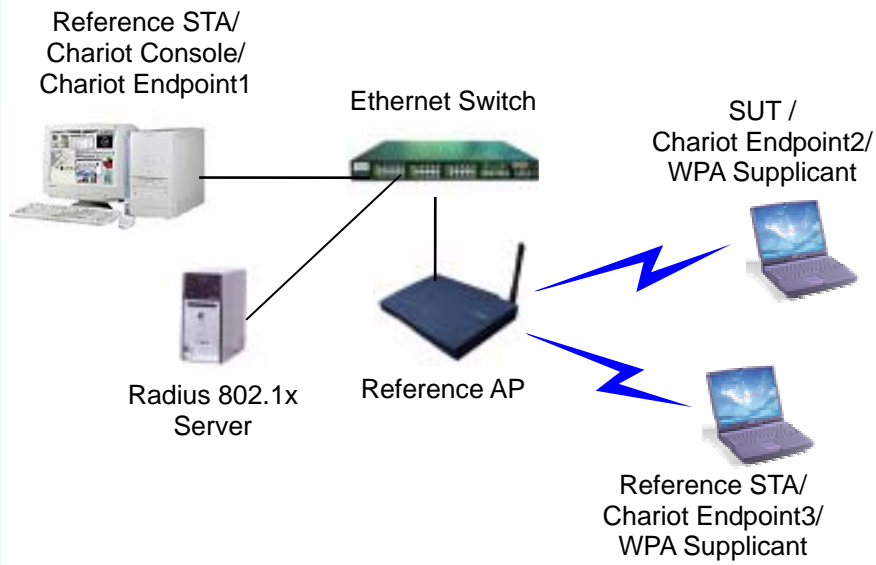


- SSID (Service Set Identity) element
- Beacon Interval
- TIM (Traffic Indication Map) element
- Data payload
- Power save
- WEP (Wired Equivalent Privacy)
- RTS (Request To Send) / CTS (Clear To Send)
- Fragmentation
- Packet Response Time
- Data rates
- Handling unexpected frames
- Ability to handle null frames
- Ability to handle unsolicited PS-Poll
- Ad Hoc support (IBSS) requirements
- WPA requirements
- IEEE 802.11a, b/g Cross Band Roaming

2. Test Configurations



WIRELESS LAN TESTBED FOR MULTICAST AND INTRA-BSS TESTING



Source : TTA/Network Testing Team

Figure 3.3

3. IEEE 802.11a Tests

3.1. Infrastructure Interoperability Tests

- **Test Purpose**

SUT TTA WLAN AP

- **Test Configurations**

(1) SSID "TTA_a"

(2)

Item	AP Setting					AP/STA Setting	
	Vendor	RTS	Fragmentation	Beacon Interval	Channel	Security	Supplicant/Server
S1	Proxim	Off	Off	100	149(5745MHz)	WPA-TLS	Funk/Funk
S2	Atheros	Off	Off	100	153(5765MHz)	WPA-PSK="12345678"	Funk/-
S3	Netgear	Off	600	120	157(5785MHz)	WPA-TLS	Funk/Funk
S4	3COM	400	Off	100	161(5805MHz)	WEP key=0x1234567890	-

- **Test Methodology**

(1) SUT AP (A1~A9)

(2) AP Station "Association" Ping

(3) Chariot Downlink Uplink FileSndL InquiryL

- **Test Results**

Scripts Setting	FileSndL		InquiryL
	Downstream	Upstream	
A1			
A2			
A3			
A4			

- **TTA Criteria**

Scripts Setting	FileSndL		InquiryL
	Downstream	Upstream	
S1	15	15	1
S2	15	15	1
S3	11	15	1
S4	13	15	1

3.2. Re-association Tests

- **Test Purpose**

STA

- **Test Configurations**

Item	Vendor	SSID	AP Channel	Security	Supplicant /Server
RA 1	SUT	TTA_a	-	WPA-PSK="12345678"	Funk/-
	Proxim AP	TTA_a	149		
	Atheros AP	TTA_a	153		
RA 2	SUT	TTA_a	-	WPA-TLS	Funk/Funk
	Proxim AP	TTA_a	149		
	Atheros AP	TTA_a	153		

* default

- **Test Methodology**

- (1) SUT Proxim AP Association
- (2) Chariot Station "Ping"
- (3) Atheros AP , Proxim AP
- (4) "Ping" 10
- (5) Proxim AP , Atheros AP
- (6) "Ping" 10

- **Test Results**

Item	Roaming
RA1	
RA2	

3.3. Data Encapsulation Tests

- **Test Purpose**

STA가 IEEE 802.2, 802.3, Ethernet II Frame

- **Test Configurations**

- (1) AP Proxim AP
- (2) SSID "TTA_a"
- (3) SSID default Association 가
- (3) AP Station, Chariot IPX , Ethernet 802.2, 802.3 Ethernet

- **Test Methodology**

- (1) SUT AP association
- (2) Chariot InquiryL

- **Test Results**

IPX encapsulation type	Results
802.2	
802.3	
Ethernet II	

3.4. Multicast Tests

- **Test Purpose**

STA가 Multicast

- **Test Configurations**

Item	STA	SSID	Channel	Power Save	Security	Supplicant /Server
MCS1	SUT	TTA_a	-	Off	WEP key=0x1234567890	-
	Netgear STA	TTA_a	-	On		
	Netgear AP	TTA_a	157	-		
MCS2	SUT	TTA_a	-	Off	WPA- PSK="12345678"	Funk/-
	Netgear STA	TTA_a	-	On		
	Atheros AP	TTA_a	161	-		

* default

- **Test Methodology**

- (1) AP STA association
- (2) Chariot MC Test Station IP Multicast 225.0.0.1
- (3) Transport UDP RealAudio Realmedia

- **Test Results**

	Realaud	Realmed
MCS1		
MCS2		

- **TTA Criteria**

Realaud 50Kbps, Realmed 180Kbps Throughput

3.5. IBSS

- **Test Purpose**

SUT가 BSS STA

- **Test Configurations**

Item	Role	IBSS Creator	Joiner	Joiner
IBA1	Vendor	SUT	Cisco	AVAYA
	ESSID	TTA	TTA	TTA
	Channel	153	-	-
	WEP	Off	Off	Off
	Fragmentation	Off	Off	Off
	RTS	Off	Off	Off
IBA2	Vendor	Proxim	SUT	Netgear
	ESSID	TTA	TTA	TTA
	Channel	157	-	-
	WEP	0x1122334455	0x1122334455	0x1122334455
	Fragmentation	Off	Off	Off
	RTS	Off	Off	Off

- **Test Methodology**

(1) Chariot FileSndL, InquiryL

- **Test Results**

Item	Source	Destination	Throughput
IBA1	AVAYA	SUT	
	SUT	AVAYA	
	Cisco	SUT	
	SUT	Cisco	
IBA2	Netgear	SUT	
	SUT	Netgear	
	Proxim	SUT	
	SUT	Proxim	

- **TTA Criteria**

STA Throughput 15Mbps TTA

4. IEEE 802.11g Tests

4.1. Infrastructure Interoperability Tests

- **Test Purpose**

SUT TTA WLAN AP

- **Test Configurations**

(1) SSID "TTA_g"

(2)

Item	AP Setting					AP/STA Setting	
	Vendor	RTS	Fragmen tation	Beacon Interval	Channel	Security	Supplicant/ Server
S1	Proxim	400	Off	100	1	WPA-TLS	Funk/Funk
S2	Cisco	500	Off	100	2	WPA-PSK="12345678"	Funk/-
S3	Linksys	300	400	120	4	WPA-TLS	Funk/Funk
S4	Buffalo	Off	500	100	6	WPA-PSK="12345678"	Funk/-

- **Test Methodology**

(1) SUT AP (A1~A9)

(2) AP Station "Association" Ping

(3) Chariot Downlink Uplink FileSndL
InquiryL

- **Test Results**

Scripts Setting	FileSndL		InquiryL
	Downstream	Upstream	
A1			
A2			
A3			
A4			

- **TTA Criteria**

Scripts Setting	FileSndL		InquiryL
	Downstream	Upstream	
S1	13	15	1
S2	13	15	1
S3	8	15	1
S4	9	15	1

4.2. Re-association Tests

- **Test Purpose**

STA

- **Test Configurations**

Item	Vendor	SSID	AP Channel	Security	Supplicant /Server
RA 1	SUT	TTA_g	-	WPA-PSK="12345678"	Funk/-
	Buffalo AP	TTA_g	6		
	Linksys AP	TTA_g	11		
RA 2	SUT	TTA_g	-	WPA-TLS	Funk/Funk
	Buffalo AP	TTA_g	6		
	Linksys AP	TTA_g	11		

* default

- **Test Methodology**

- (1) SUT Buffalo AP Association
- (2) Chariot Station "Ping"
- (3) Linksys AP , Buffalo AP
- (4) "Ping" 10
- (5) Buffalo AP , Linksys AP
- (6) "Ping" 10

- **Test Results**

Item	Roaming
RA1	
RA2	

4.3. Data Encapsulation Tests

- **Test Purpose**

STA가 IEEE 802.2, 802.3, Ethernet II Frame

- **Test Configurations**

- (1) AP Buffalo AP
- (2) SSID "TTA_g"
- (3) SSID default Association 가
- (3) AP Station, Chariot IPX , Ethernet 802.2, 802.3 Ethernet

- **Test Methodology**

- (1) SUT AP association
- (2) Chariot InquiryL

- **Test Results**

IPX encapsulation type	Results
802.2	
802.3	
Ethernet II	

4.4. Multicast Tests

- **Test Purpose**

SUT가 Multicast

- **Test Configurations**

Item	STA	SSID	Channel	Power Save	Security	Supplicant /Server
MCS1	SUT	TTA_g	-	Off	WEP key=0x1234567890	-
	Netgear STA	TTA_g	-	On		
	Proxim AP	TTA_g	4	-		
MCS2	SUT	TTA_g	-	Off	WPA- PSK="12345678"	Funk/-
	Netgear STA	TTA_g	-	On		
	Linksys AP	TTA_g	6	-		

* default

- **Test Methodology**

- (1) AP STA association
- (2) Chariot MC Test Station IP Multicast 225.0.0.1
- (3) Transport UDP RealAudio Realmedia

- **Test Results**

	Realaud	Realmed
MCS1		
MCS2		

- **TTA Criteria**

Realaud 50Kbps, Realmed 180Kbps Throughput

4.5. IBSS

- **Test Purpose**

SUT가 BSS STA

- **Test Configurations**

Item	Role	IBSS Creator	Joiner	Joiner
IBA1	Vendor	SUT	Proxim	Linksys
	ESSID	TTA	TTA	TTA
	Channel	11	-	-
	WEP	Off	Off	Off
	Fragmentation	Off	Off	Off
	RTS	Off	Off	Off
IBA2	Vendor	Netgear	SUT	Buffalo
	ESSID	TTA	TTA	TTA
	Channel	5	-	-
	WEP	0x1122334455	0x1122334455	0x1122334455
	Fragmentation	Off	Off	Off
	RTS	Off	Off	Off

- **Test Methodology**

(1) Chariot FileSndL, InquiryL

- **Test Results**

Item	Source	Destination	Throughput
IBA1	Proxim	SUT	
	SUT	Proxim	
	Linksys	SUT	
	SUT	Linksys	
IBA2	Netgear	SUT	
	SUT	Netgear	
	Buffalo	SUT	
	SUT	Buffalo	

- **TTA Criteria**

STA Throughput 3.3Mbps TTA

4.6. IEEE 802.11b Backward Campatibility

- **Test Purpose**

IEEE 802.11b AP

- **Test Configurations**

(1) Infrastructure Mode

Item	11b AP Setting					AP/STA Setting	
	Vendor	Beacon	RTS	Fragmentation	Channel	Security	Supplicant/Server
BS1	Cisco	100ms	Off	Off	5	Off	-
BS2	Linksys	100ms	Off	Off	1	WPA-PSK="12345678"	Funk/-

(2) (Infrastructure Mode and Multicast) : Simultaneously transfer(APUT to STAs)

IEEE 802.11g Proxim AP: Beacon=100ms, RTS=Off, Frag.=Off, WEP=On/Off, PS=Off, Channel=10/6							
Item	STA Vendor	STA RTS	STA Fragmentation	Power Save	AP Channel	Security	Supplicant/Server
BS3	11b Acrowave	Off	Off	Off	10	Off	Off
	SUT	Off	Off	Off	10	Off	Off
BS4	11b Netgear	Off	Off	Off	6	WPA-TLS	Funk/Funk
	SUT	Off	Off	Off	6	WPA-TLS	Funk/Funk

- **Test Methodology**

(1) SUT AP (BS1~BS4) BS3 BS4

IEEE 802.11g Proxim AP SUT STA

(2) AP Station "Association" Ping

(3) FileSndL, Inquiry, Realaud

- **Test Results**

Scripts Setting	FileSndL		InquiryL
	Downstream	Upstream	
BS1			
BS2			

Scripts Setting	FileSndL		Realaud
	Downstream(Simultaneous)		
BS3	11b Acrowave		
	SUT		
BS4	11b Netgear		
	SUT		

- **TTA Criteria**

Scripts Setting	FileSndL		InquiryL
	Downstream	Upstream	
BS1	3.3	3.3	0.32
BS2	3.3	3.3	0.32

Scripts Setting	FileSndL		Realaud
	Downstream(Simultaneous)		
BS3	11b Acrowave	1.7	0.03
	SUT	3.3	0.03
BS4	11b Netgear	1.7	0.03
	SUT	3.3	0.03

5. IEEE 802.11a, b/g Tests

5.1. Cross-Band Roaming Tests

- **Test Purpose**

Station

Roaming

- **Test Configurations**

Item	Vendor	SSID	Channel	Security	Supplicant /Server
RA 1	11a Proxim AP	TTA	149	WPA-PSK="12345678"	Funk/-
	11b Buffalo AP	TTA	1		
	11a 3COM AP	TTA	153		
	11g Linksys AP	TTA	6		
	SUT	TTA	-		
RA 2	11a Proxim AP	TTA	149	WPA-TLS	Funk/Funk
	11b Buffalo AP	TTA	1		
	11a 3COM AP	TTA	153		
	11g Linksys AP	TTA	6		
	SUT	TTA	-		

* default

- **Test Methodology**

- (1) Proxim 802.11a AP SUT Association
- (2) Chariot Station "Ping"
- (3) Buffalo 802.11b AP , Proxim AP
- (4) "Ping" 10
- (5) 3COM 802.11a AP , Buffalo AP
- (6) "Ping" 10
- (7) Linksys 802.11b/g AP , 3Com AP
- (8) "Ping" 10
- (9) Proxim 802.11a AP , Linksys AP
- (10) "Ping" 10

- **Test Results**

Roaming :

6. WPA Function Tests

6.1. WPA Negative Tests

- **Test Purpose**

SUT가 reference AP

- **Test Configurations**

Item	SUT	AP	SSID	Channel
WA1	WPA-TLS	WEP On	TTA	149
WA2	WPA-TLS	WPA-PSK	TTA	149
WA3	WPA-TLS	Off	TTA	9
WA4	WPA-PSK	WPA-TLS	TTA	9

* default

- **Test Methodology**

(1) Association

- **Test Results**

		Results
SUT	AP	
WPA-TLS	WEP On	
WPA-TLS	WPA-PSK	
WPA-TLS	Off	
WPA-PSK	WPA-TLS	