



MEDIATEK

MT7986 Spatial Reuse Application Note

V1.0

CTD CT Lin, Molecule, Wayne

ICB Bill, Enos

Document Revision History

Version	Date	Description	Note
1.0	2020/02/12	Initial version	

Outline

- Introduction
- Profile Setting
- Performance Test Result
- Debug Info

Introduction

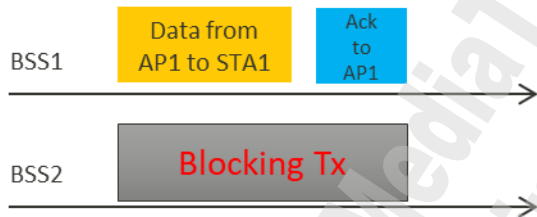
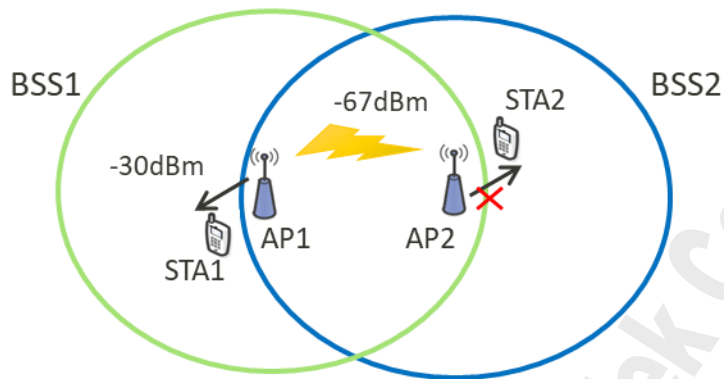


Spatial Reuse

- ❑ 11ax introduces SR based on OBSS Packet Detection (PD) :
 - When *HE STA receives a inter-BSS PPDU which meets the OBSS-PD criteria, HE STA can ignore this PPDU before the end of PPDU and then HE STA may have additional transmission opportunity
 - SR enhances the total TX used airtime of the channel in dense scenario and thus improves the area throughput

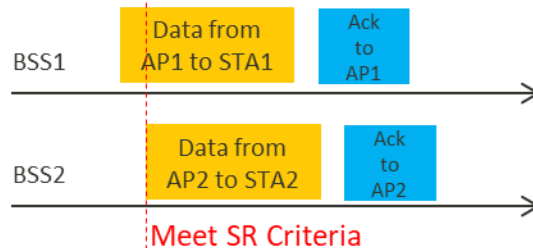
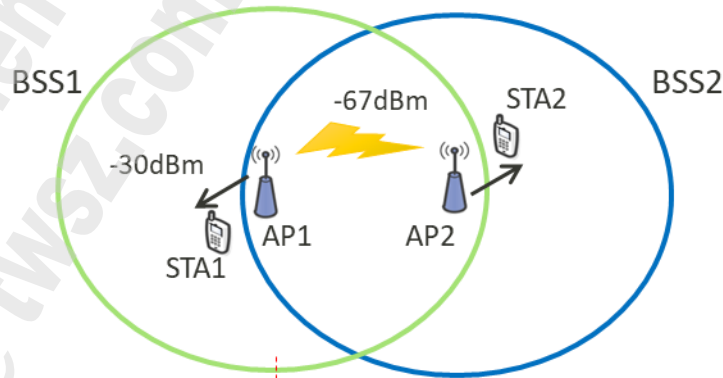
Spatial Reuse

Traditional CCA



AP2 receives the data from AP1 to STA1, AP2 physical CCA is BUSY. So AP2 can't transmit data to STA2.

Spatial Reuse



AP2 receives the data from AP1 to STA1 which meets SR criteria, AP2 can drop it then physical CCA is IDLE. So AP2 can transmit data to STA2.

Profile Setting



Web UI

LEDE Status System Services Network MTK Logout

No password set!

There is no password set on this router. Please configure a root password to protect the web interface and enable SSH.
Go to [password configuration](#)...

Wireless Overview

MT7915
Driver version: 7.1.0.0

MT7915.1.1
Work mode: AP

Interface: ra0 | Type: AP | SSID: MTK_HARRIER_AP_2.4G | Channel: 6
BSSID: 00:0c:43:26:46:38 | Mode: HE_2G mode

Interface: apcli0 | Type: STA | Status: Disconnected
Wireless is disabled or not associated

MT7915.1.2
Work mode: AP

Interface: ra0 | Type: AP | SSID: MTK_HARRIER_AP_5G | Channel: 157
BSSID: 02:0c:43:36:46:38 | Mode: HE_5G mode

Interface: apcli0 | Type: STA | Status: Disconnected
Wireless is disabled or not associated

Device Configuration - MT7915.1.1

Basic Advanced HE_MU Power Boost **Others**

Channel Channel 6 (2437 GHz)

BSS color

Co-located BSSID set max index 1

TWT Support Enable

Save and Apply Save Reset

Device Configuration - MT7915.1.1

Basic Advanced HE_MU Power Boost **Others**

Beam Forming & MIMO 0 ETxBF (SU)

Spatial Reuse ☒ Enable ☐ Disable

Save and Apply Save Reset

Configuration File

	Description
SREnable	Enable/Disable Spatial Reuse 0:Disable 1:Enable(Default)
SRMode	Set SR Mode 0:Aggressive(Default) 1:Conservative

VOW_Group_Min_Ratio=
VOW_Group_Max_Ratio=
VOW_Airtime_Ctrl_En=
VOW_Rate_Ctrl_En=
VOW_Group_Min_Rate_Bucket_Size=
VOW_Group_Max_Rate_Bucket_Size=
VOW_Group_Min_Airtime_Bucket_Size=
VOW_Group_Max_Airtime_Bucket_Size=
VOW_Group_Backlog=
VOW_Group_Max_Wait_Time=
VOW_Group_DWRR_Quantum=
WscConfMode=0;0
WscConfStatus=2;1
ETxBfEnCond=1;1;
ITxBfEn=0;0;
MuOfdmaDlEnable=1;1;
MuOfdmaUlEnable=1;1;
MuMimoDlEnable=1;1;
MuMimoUlEnable=1;1;
SREnable=1;1
SRMode=0;0
SRSEnable=1;1
PPEnable=0;1
EDCCAEnable=1;1
MACRepeaterEn=
MACRepeaterOuiMode=2
ApCliEnable=0;0
ApCliSsid=;
ApCliWirelessMode=;
ApCliBssid=;
ApCliAuthMode=;
ApCliEncrypType=;
ApCliWPAPSK=
ApCliWPAPSK1=
ApCliDefaultKeyID=;
ApCliKey1Type=;
ApCliKey2Type=;
ApCliKey3Type=;
ApCliKey4Type=;
- DBDC_card0.dat [Readonly] 360/436 82%

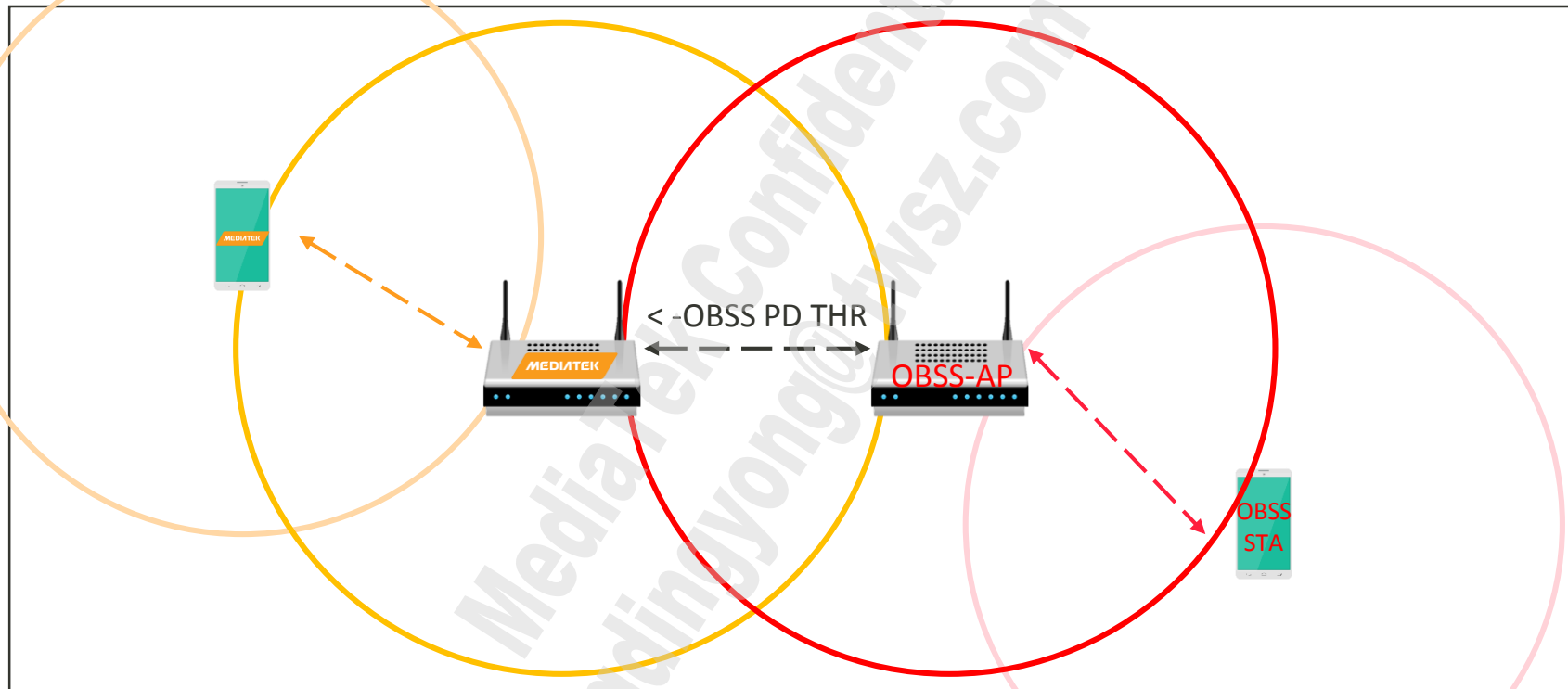
```
root@LEDE:/etc/wireless/mediatek# pwd
/etc/wireless/mediatek
root@LEDE:/etc/wireless/mediatek# ls
DBDC_card0.dat      mt7915.1.dat      mt7915.dbdc.b1.dat  version
mt7615e-sku-bf.dat  mt7915.2.dat      mt7915.slt.b0.dat
mt7615e-sku.dat     mt7915.dbdc.b0.dat mt7915.slt.b1.dat
root@LEDE:/etc/wireless/mediatek#
```



Performance Test

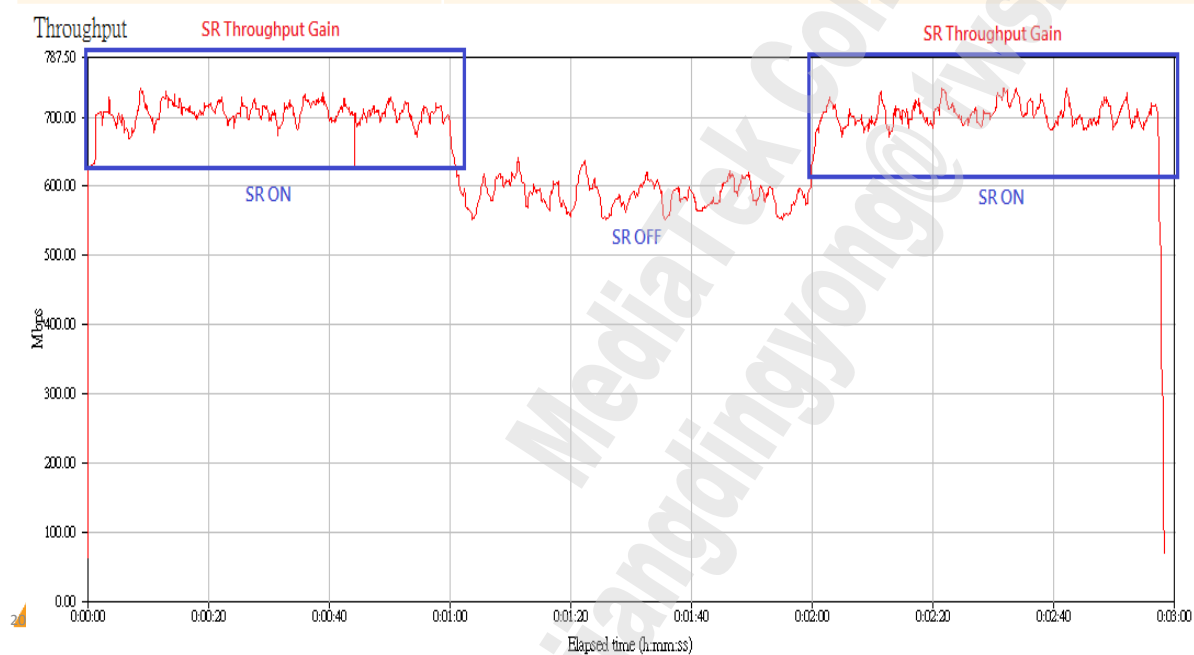


Environment Setup



Test Result

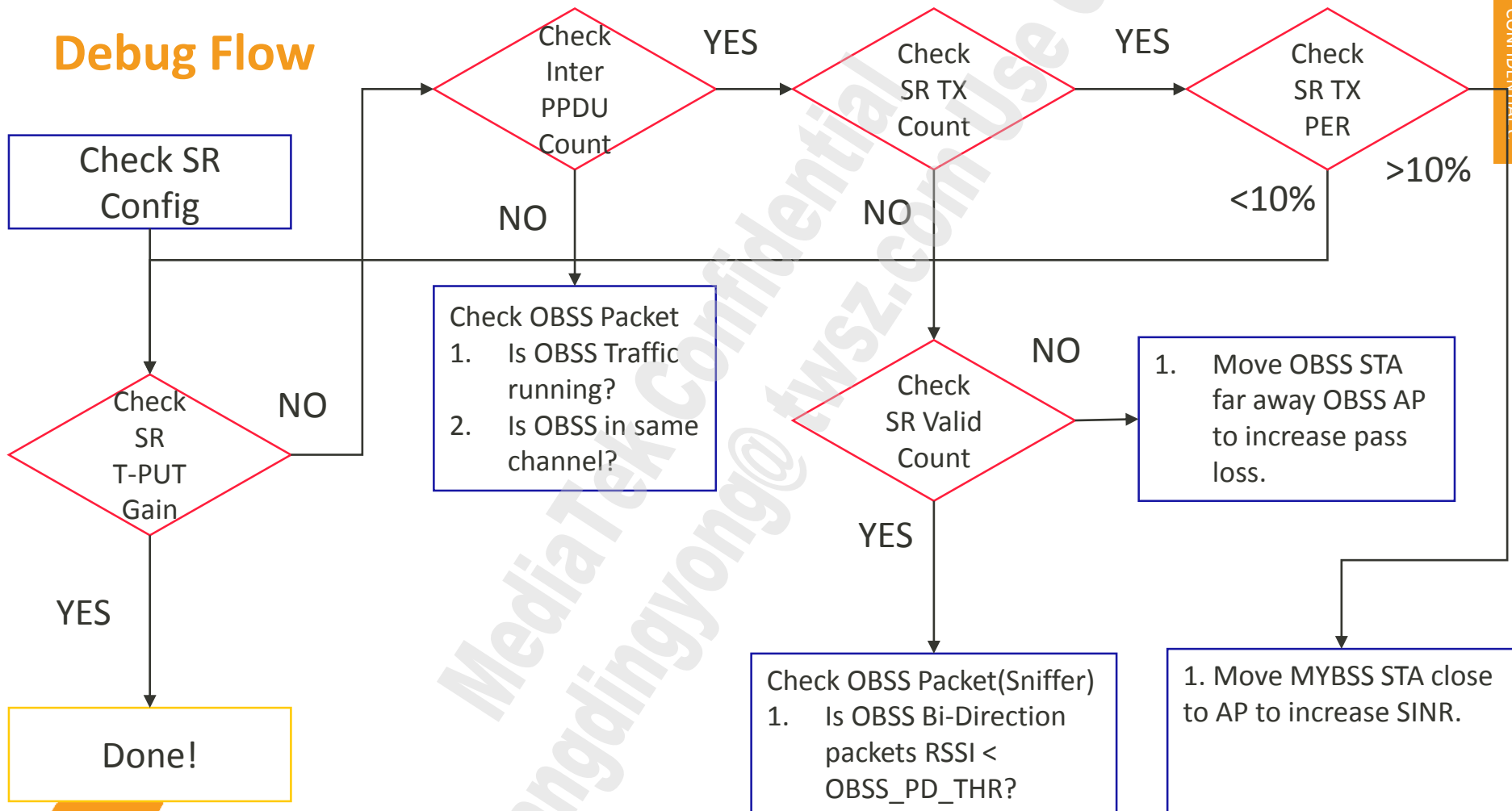
DUT SR	MY-BSS DL T-PUT	OBSS DL T-PUT
ON	700M	500M
OFF	500M	500M



Debug Info



Debug Flow



Debug Counter

- iwpriv ra0 show srind=0

1. Inter PPDU Count → u2InterBssPpduCnt
2. SR Tx Count → u4SrAmpduMpduCnt
3. SR Valid Count → u2NonSrgVldCnt
4. SR Tx PER → $(u4SrAmpduMpduCnt - u4SrAmpduMpduAckedCnt) / u4SrAmpduMpduCnt$

```

root@LEDE:/# iwpriv ra0 show srind=0
[ 914.968986] PrintSrCmd:
[ 914.968986] u1CmdSubId = 12, u1ArgNum = 1, u1DbdcIdx = 0, u1Status = 0
[ 914.968986] u1DropTaIdx = 0, u1StaIdx = 0
[ 914.982179] PrintSrEvent:
[ 914.982179] u1EventSubId = 4, u1ArgNum = 0, u1DbdcIdx = 0, u1Status = 0
[ 914.982179] u1DropTaIdx = 0, u1StaIdx = 0
[ 914.995475] PrintSrInd:
[ 914.995475] u1NonSrgInterPpduRcpi = 0, u1SrgInterPpduRcpi = 0
[ 914.995475] u2NonSrgVldCnt = 0, u2SrgVldCnt = 0
[ 914.995475] u2IntraBssPpduCnt = 15, u2InterBssPpduCnt = 0
[ 914.995475] u2NonSrgPpduVldCnt = 0, u2SrgPpduVldCnt = 0
[ 914.995475] u4SrAmpduMpduCnt = 0, u4SrAmpduMpduAckedCnt = 0

```

MEDIATEK

everyday genius