MT7986 Spatial Reuse Application Note

V1.0

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Document Revision History

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

Outline

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

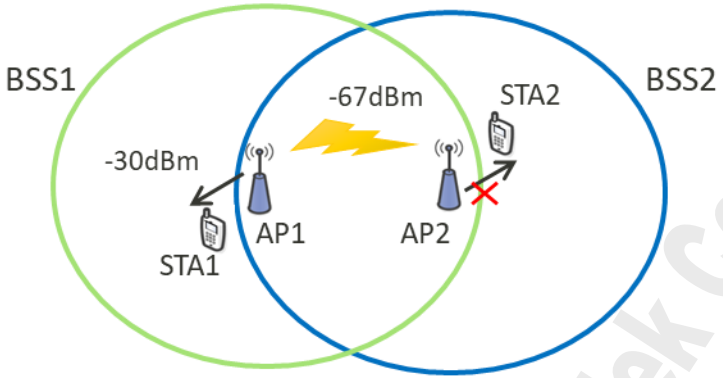
Introduction

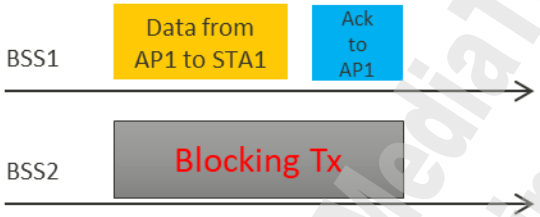
Spatial Reuse

- 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

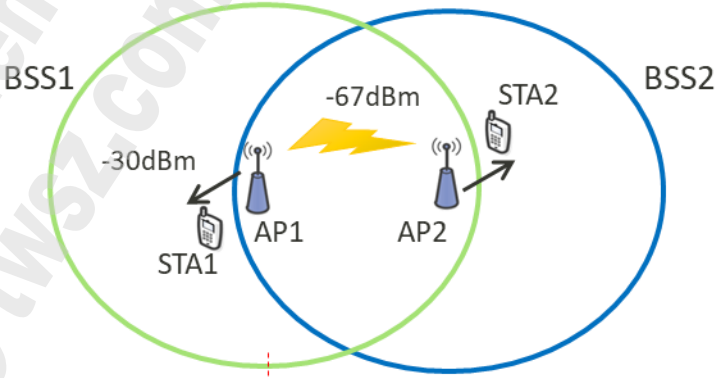
Traditional CCA

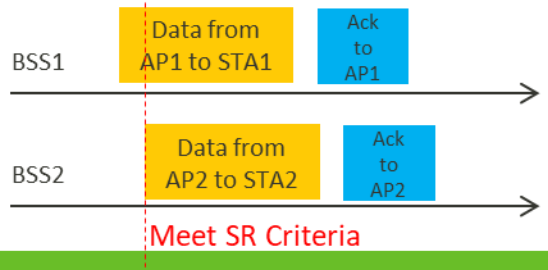




AP2 receives the data from AP1 to STA1,AP2 physical CCA is BUSY.
So AP2 can't transmit data to STA2.

Spatial Reuse

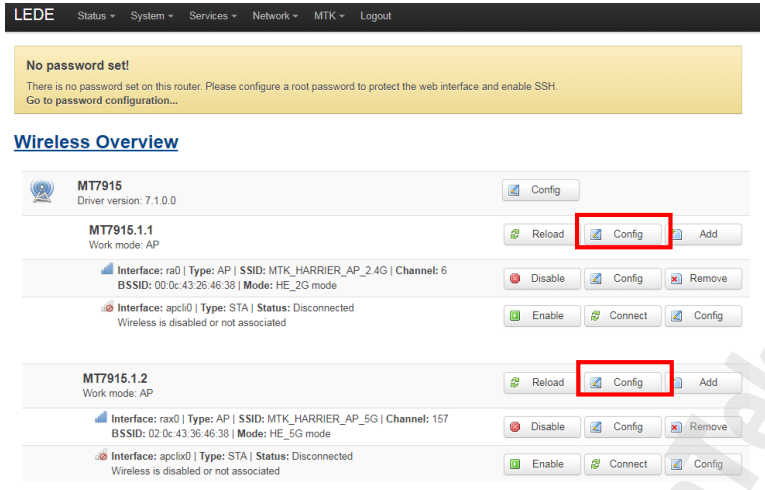


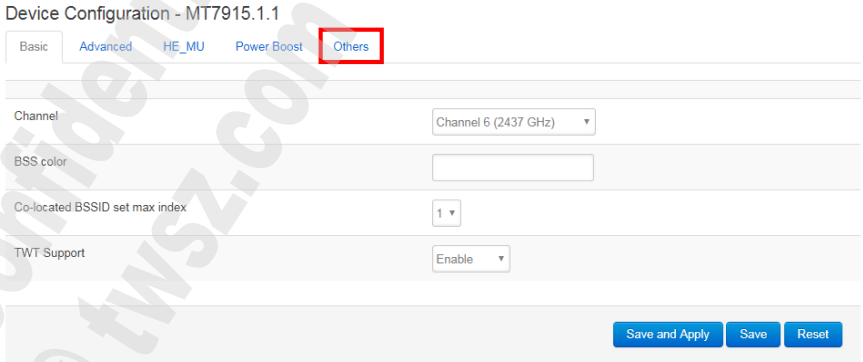


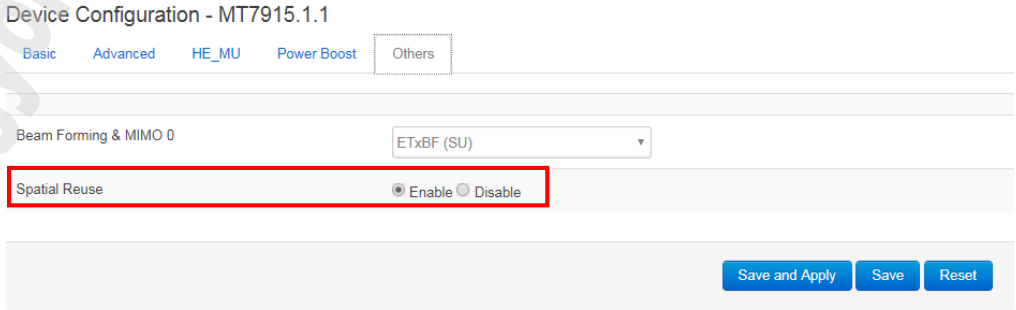
AP2 receives the data from AP1 to STA1 which meets SR criteria, AP2 can drop it then physical CCA is IDLE.
So AP2 can transmit data to STA2.

Profile Setting

Web UI







Configuration File

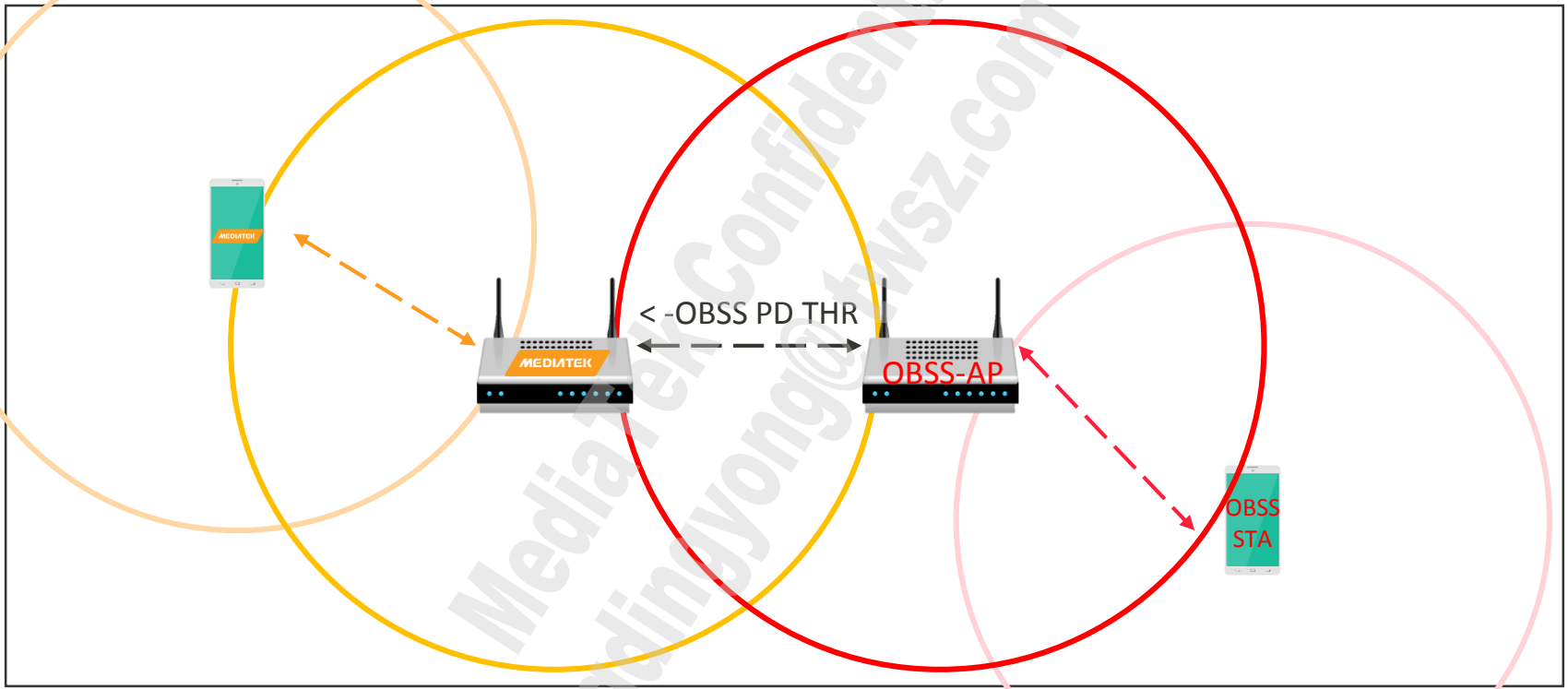
	Description
SREnable	Enable/Disable Spatial Reuse 0:Disable 1:Enable(Default)
SRMode	Set SR Mode 0:Aggressive(Default) 1:Conservative

```
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#
```

```
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
SRSDEnable=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%
```

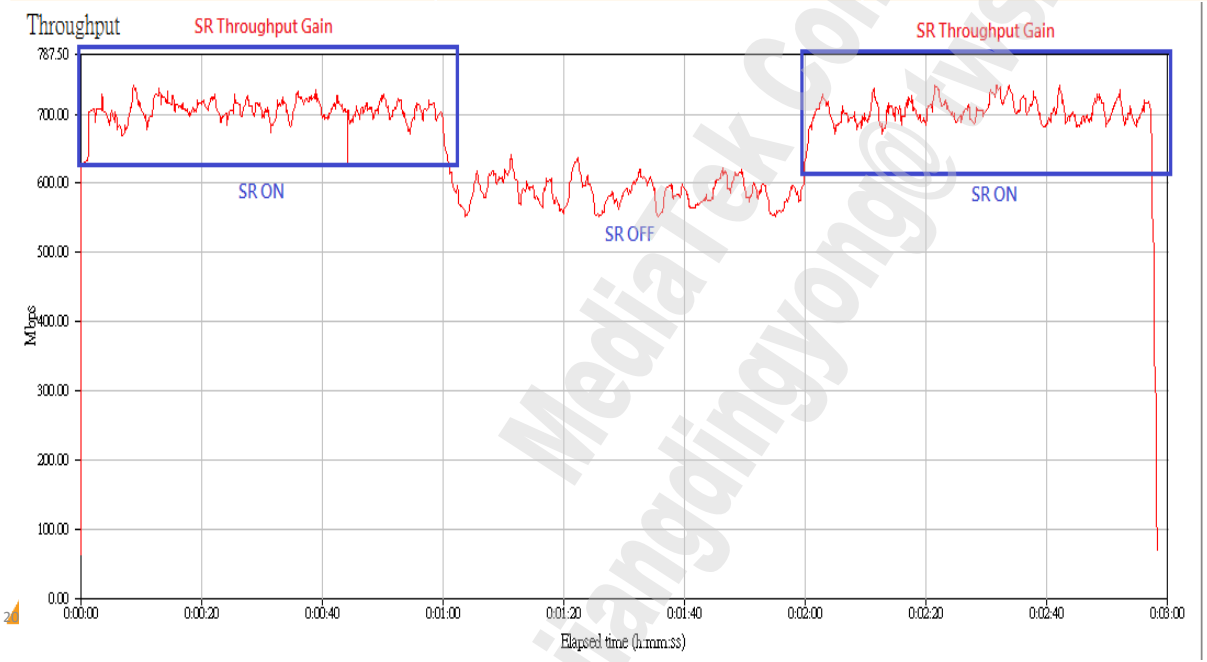
Performance Test

Environment Setup



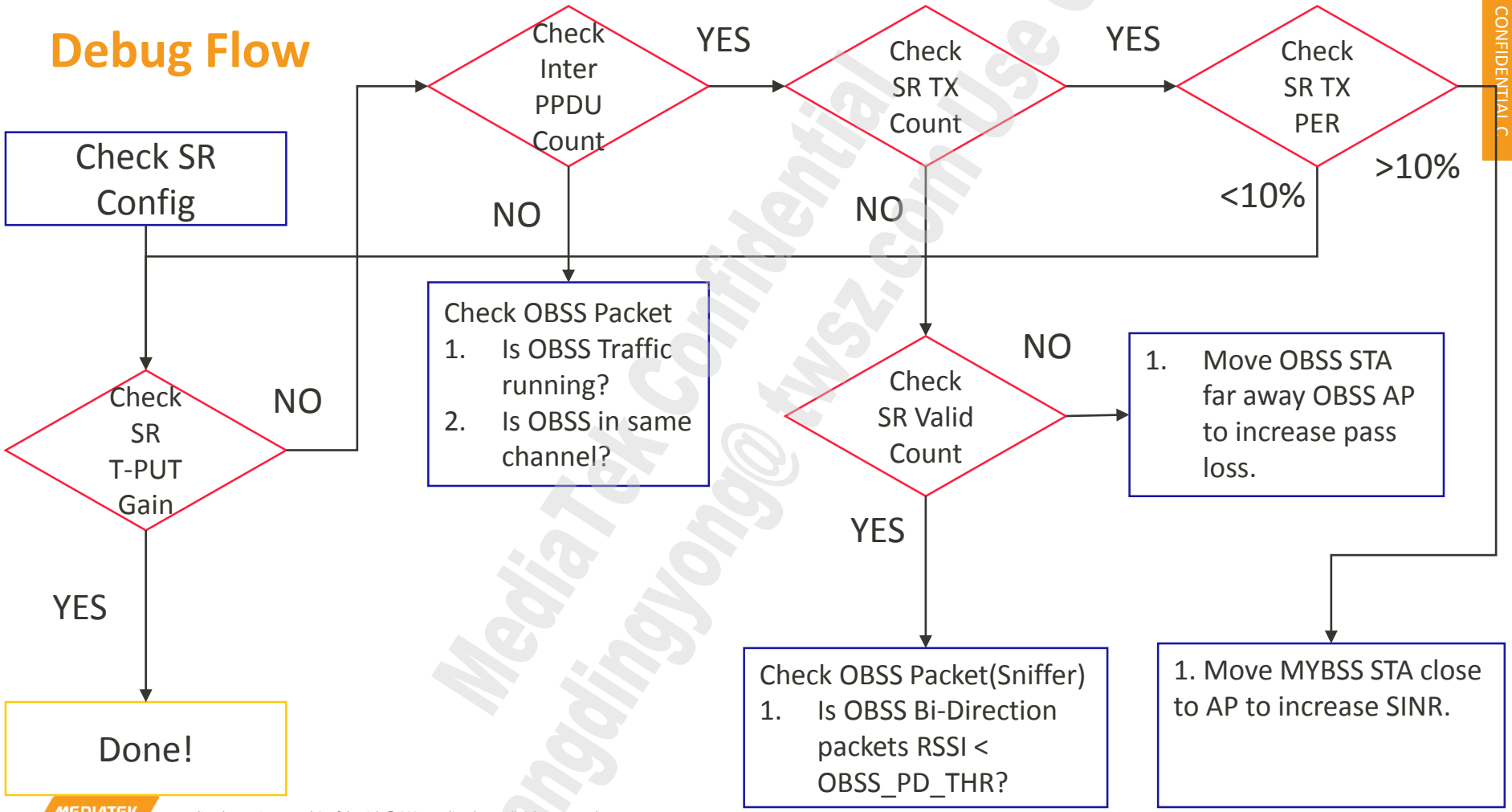
Test Result

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
```