Initialization scenario case study on interference situation

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Wu Xuyong, Zhao Quanbo, Pan Zhong	Voice:	+86-755-28780808 +86-13008831013
Huawei Technologies	Fax:	+86-755-28971667
Huawei Industrial Base, Bantian,Longgang,	E-mail:	wuxuyong@huawei.com
Shenzhen 518129 P.R.C		

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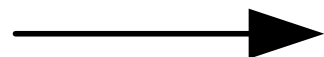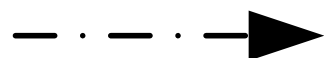
Basic situation

OBS

SS1

IBS

HUAWEI
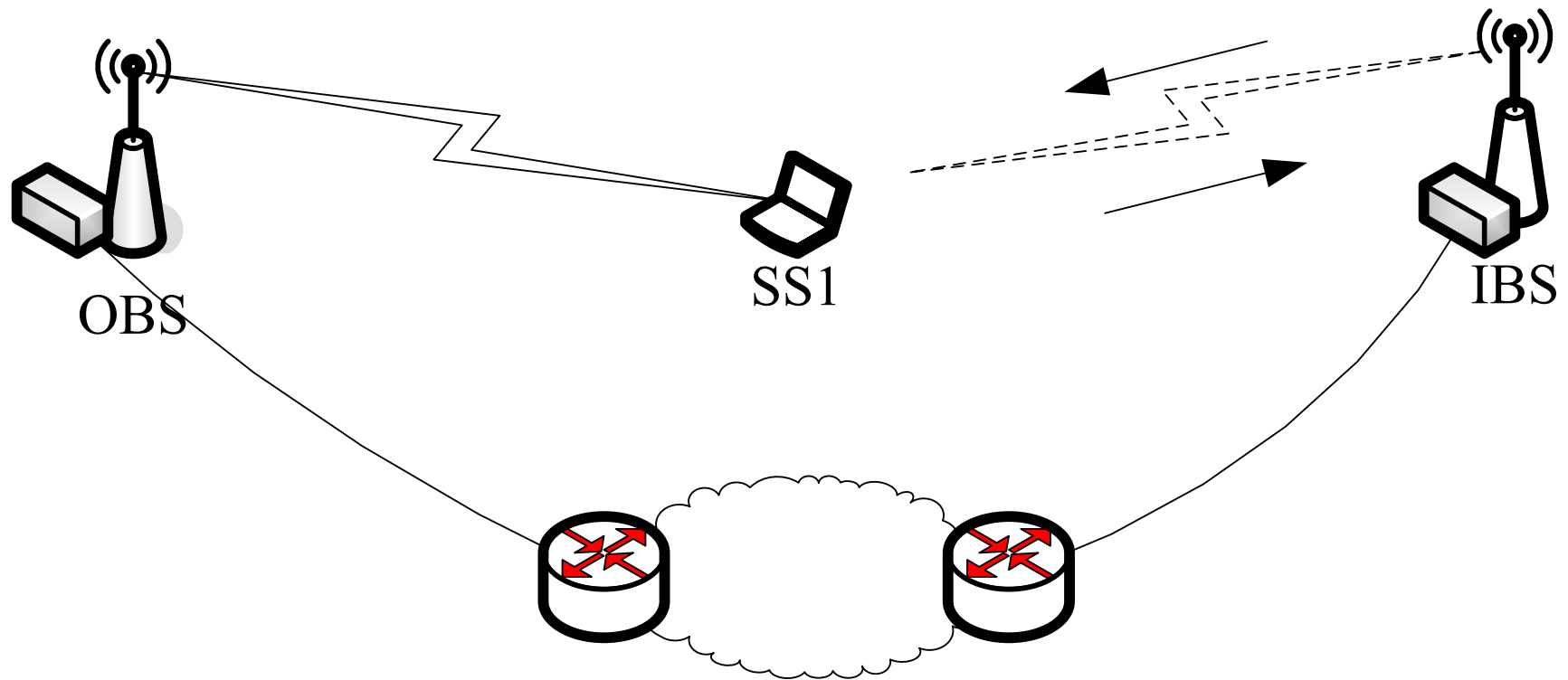
Case Study

- *Case1x：IBS interference/signaling can not detected by SS1*
  - *Case1a：the IBS can not detect the signal from the operating network*
  - *Case1b：the IBS can detect the signal from the operating network, but not decodable*
  - *Case1c：the IBS can detect and decode the signaling from the operating network*
- *Case2x：IBS interference/signaling can detected by SS1 but not decodable*
  - *Case2a：the IBS can not detect the signal from the operating network*
  - *Case2b：the IBS can detect the signal from the operating network, but not decodable*
  - *Case2c：the IBS can detect and decode the signaling from the operating network*
- *Case3x：IBS interference/signaling can detected and decoded by SS1*
  - *Case3a：the IBS can not detect the signal from the operating network*
  - *Case3b：the IBS can detect the signal from the operating network, but not decodable*
 - *Case3c：the IBS can detect and decode the signaling from the operating network*

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legend

→ Interference/signaling detectable and decodable

– · – · → Interference/signaling detectable but not decodable

– · ✕ · → Interference/signaling not detectable

⋮ Interference/signaling detected and decoded

| Interference/signaling detected but not able to decode

| Interference/signaling not detected

✔ Known IP addr wire link is usable

✗ Without IP addr wire link is not usable

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Case Study (continue)

Case 1x

Case 2x

Case 3x

Case Na

Case Nb

Case Nc

OBS   SS1   IBS

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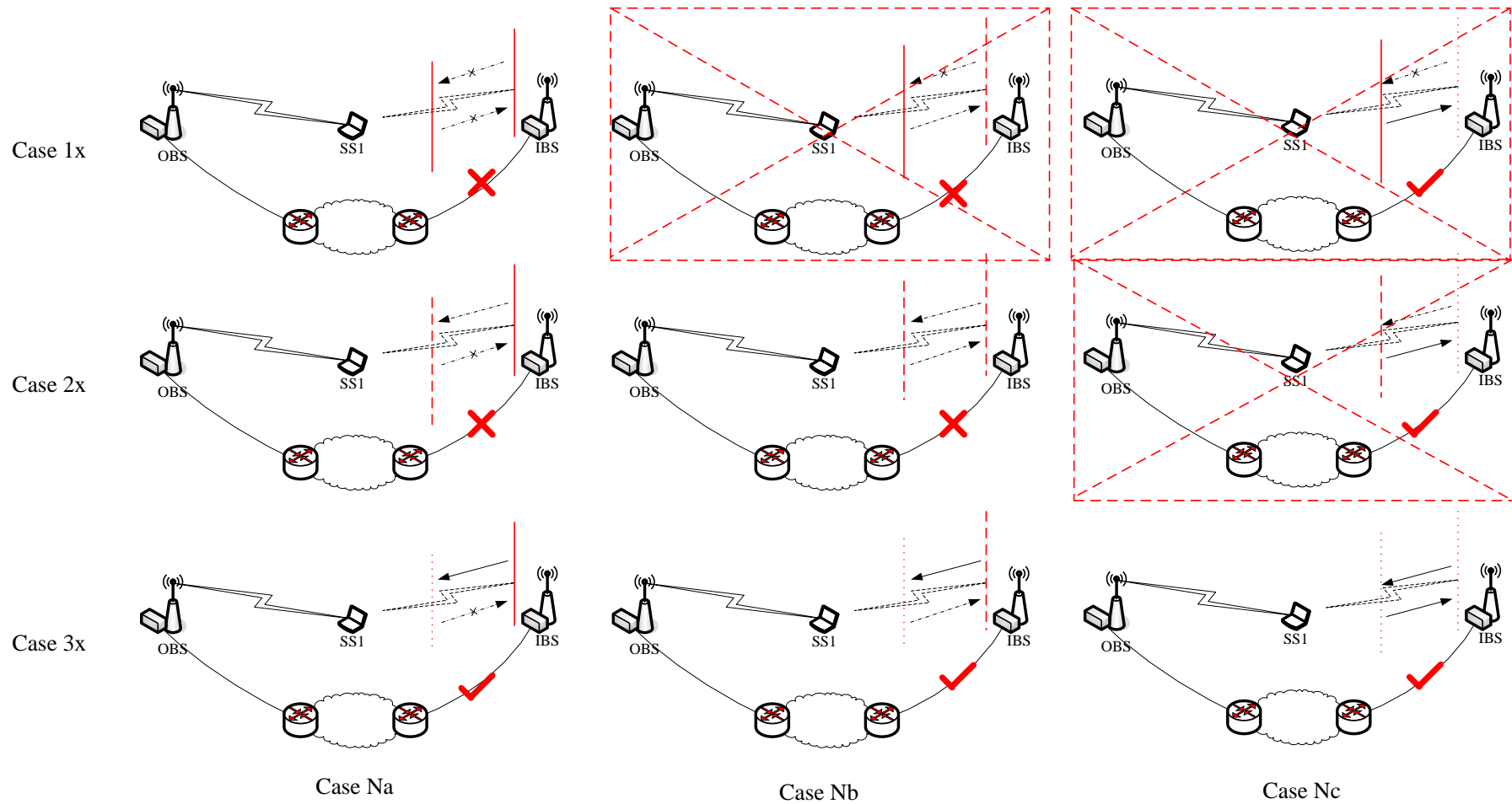
Case 1x Study

- *[Note: although logically case 1b and 1c could happen, these cases are not normally exist, because the channel propagation are symmetric in both direction, but the BSs' transmition power are normally higher than the SSs'. So when the IBS couldn't been detected by SS1, the IBS will not detect SS1's signal also.]*

- *In these cases IBS doesn't interference with SS1, which means the OBS's network is not necessary to contact IBS. So* **case 1x(1a/1b/1c) are not the target initialization scenarios in 16h.**

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Case 2x Study

- *[Note: case 2c normally doesn't happen for the same reason with case 1b & 1c.]*

- *In these cases, IBS's signaling could be detected by SS1, but SS1 could not decode the signaling. The problem here is, IBS may interfere to SS1, but SS1 can't know who is the interferer, so it can not tell the OBS who is the interferer, so the OBS could not contact IBS for cooperation. These cases is the worst cases that 16h should deal with.*

- *The reason for this problem is the difference of condition between decodable signaling and troubling interference. The condition could be measured in SNR requirement, **the lower SNR required for the signaling, the lower probability to have this problem**; another approach may help was introduced to the working document 15.2.1.1.3[2] in the meetings before is shown in IEEE C802.16h-05/041[3],and we could easily understand it in the following figure.*
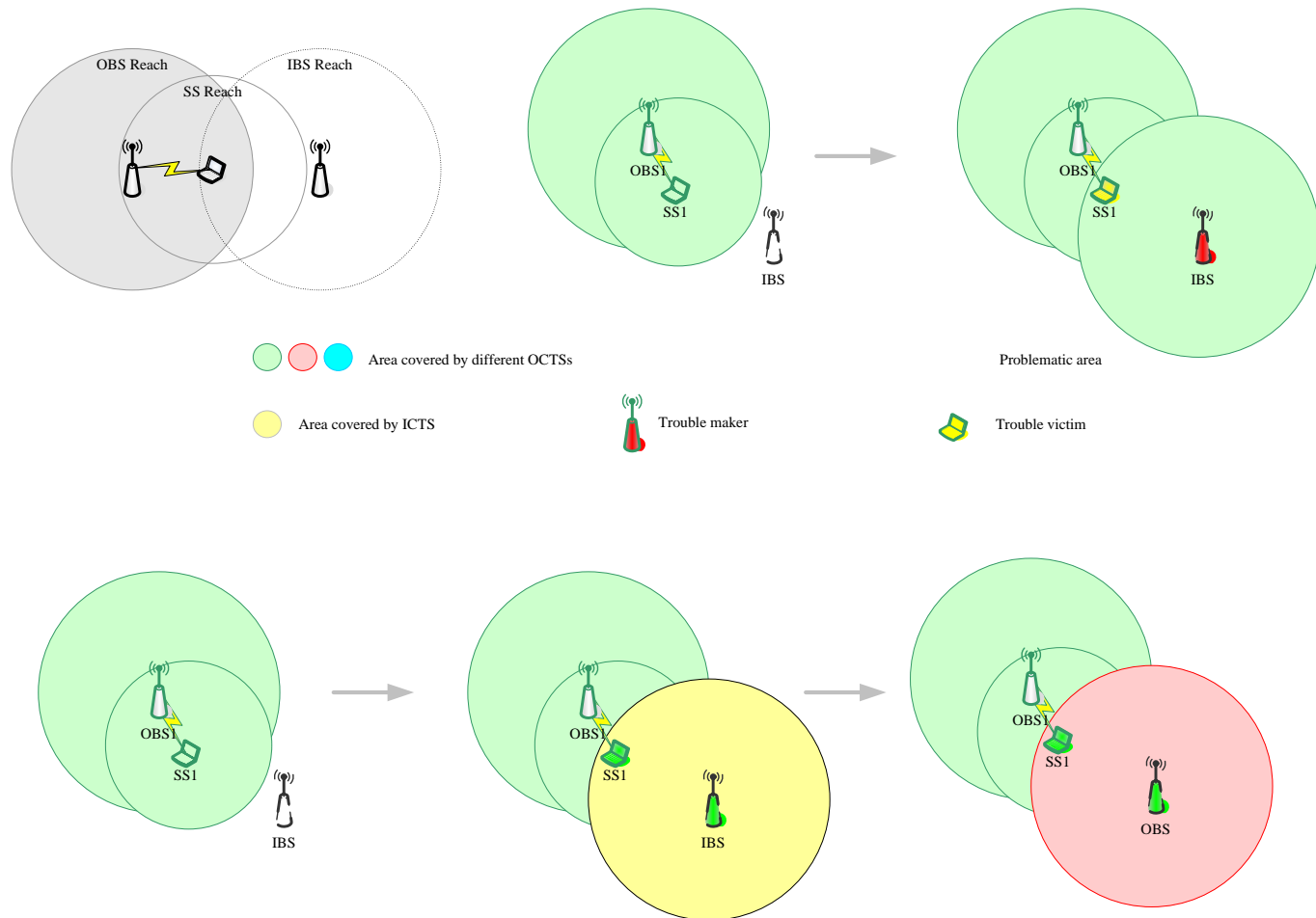
Case 2x Study (continue)
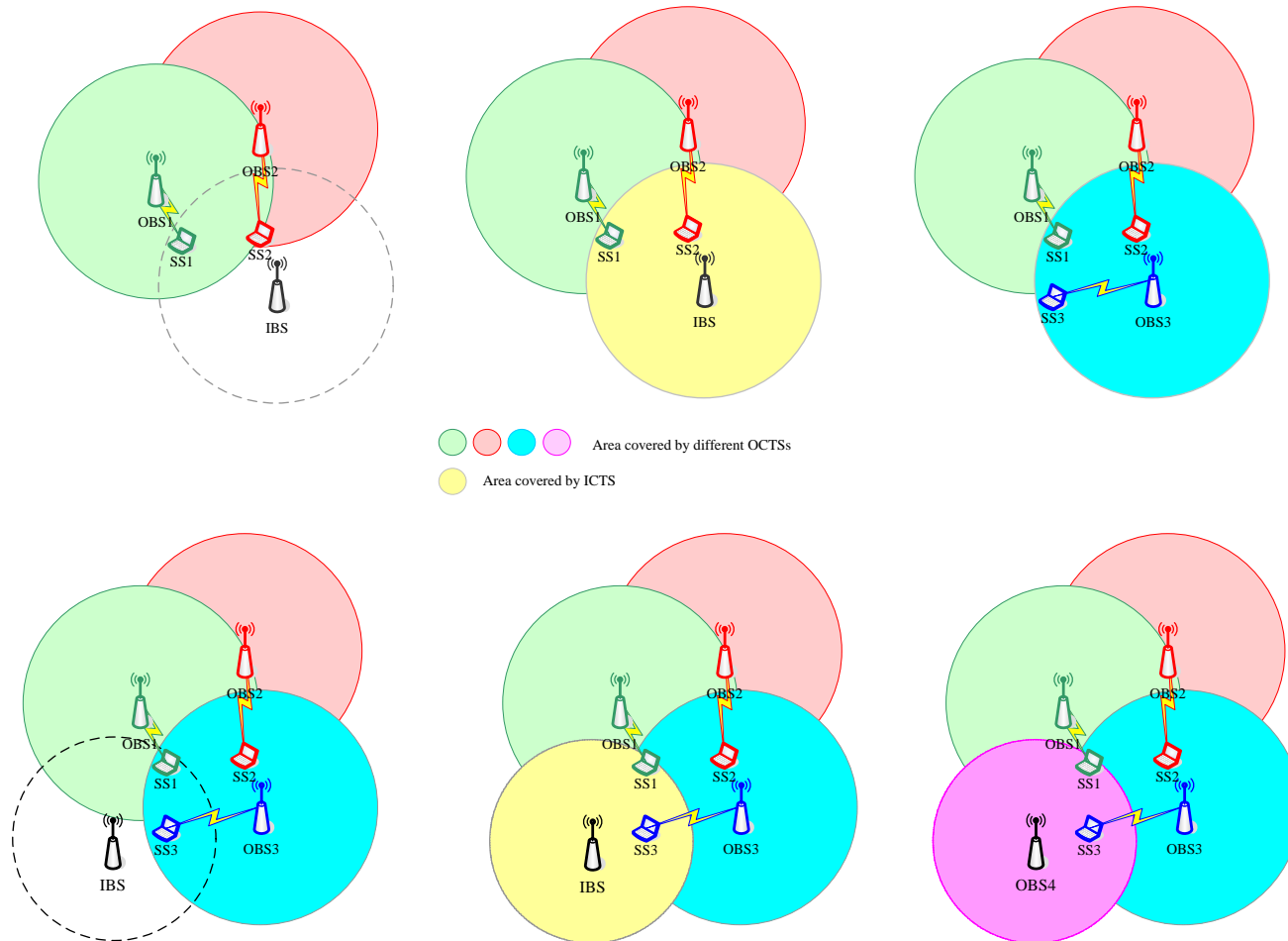
SS2

SS1

OBS

IBS

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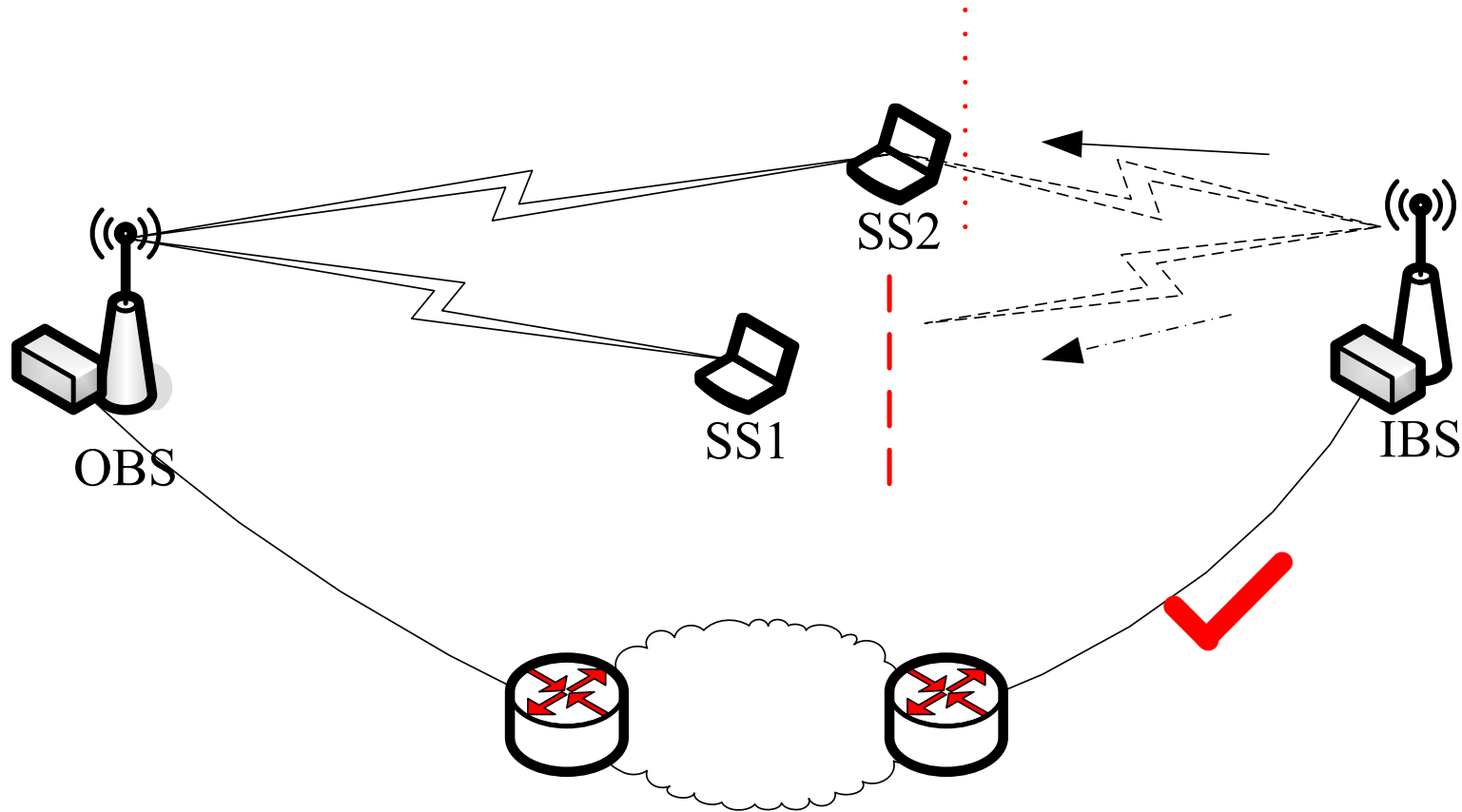
Case 3x Study

- *These cases are most interesting cases that 16h need to make out the solution. We can see each one of the 3 cases here is a normal case, and we need to deal with them all. In order to find the common solution, we need to take the advantage of the common condition. That is, SS can decode the IBS signaling. It's understood that if we don't depends on the IBS signaling transmition, in case 3a and 3b, operation network will not be able to **find IBS in the core network**. And the only way we may enable the operating network to do this is using the SS to relay the signaling which is managed to contain the IP address information.*

- *The **security issue may be mitigated** by checking the instant random key and frame numbering in the contact requirement message sent by the OBS. That may prevent the IBS being cheated by someone faraway or by someone which is not able to control or access the 16h air link. We may need to think about this approach if we have no other choice to meet the cooperation contact requirement in case 3a and 3b.*
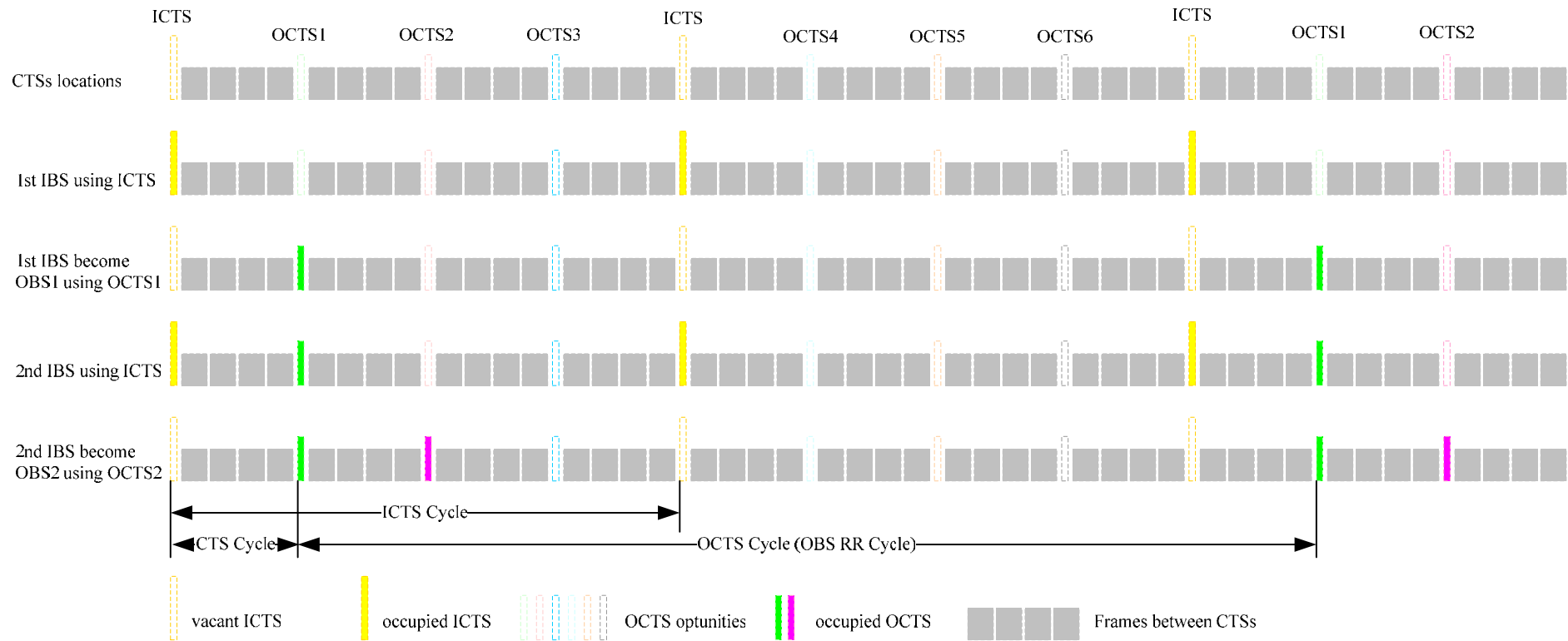
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different between random/fixed ICTS

OBS Reach

IBS Reach

SS Reach

OBS1

SS1

IBS

Area covered by different OCTSs

Area covered by ICTS

Trouble maker

Trouble victim

Problematic area

OBS1

SS1

IBS

OBS1

SS1

IBS

OBS1

SS1

IBS

OBS1

SS1

OBS

HUAWEI

Examples of using ICTS

ICTS/OCTS parameters

discussion