

A Tale of IMS Correlation

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Background

TS 33.108: CC on HI3

```
Voip-CC-PDU ::= SEQUENCE
```

```
{  
  voipULIC-header    [1] VoipULIC-header,  
  payload            [2] OCTET STRING  
}
```

```
VoipULIC-header ::= SEQUENCE
```

```
{  
  hi3voipDomainId    [0] OBJECT IDENTIFIER, -- 3GPP VoIP HI3 Domain  
  lIID               [2] LawfulInterceptionIdentifier OPTIONAL,  
  voipCorrelationNumber [3] VoipCorrelationNumber, -- Contained in CorrelationValues  
  timeStamp          [4] TimeStamp OPTIONAL,  
  sequence-number    [5] INTEGER (0..65535),  
  t-PDU-direction    [6] TPDU-direction,  
  national-HI3-ASN1parameters [7] National-HI3-ASN1parameters OPTIONAL,  
  -- encoded per national requirements  
  ice-type           [8] ICE-type OPTIONAL,  
  -- The ICE-type indicates the applicable Intercepting Control Element in which  
  -- the VoIP CC is intercepted.  
}
```

```
VoipCorrelationNumber ::= OCTET STRING
```

TS 33.108: IRI on HI2

```
GPRSCorrelationNumber ::= OCTET STRING (SIZE (8..20))
```

```
EPSCorrelationNumber ::= OCTET STRING
```

```
CorrelationValues ::= CHOICE {
```

```
    iri-to-CC      [0]    IRI-to-CC-Correlation,
```

```
    iri-to-iri     [1]    IRI-to-IRI-Correlation,
```

```
    both-IRI-CC   [2]    SEQUENCE {
```

```
        iri-CC [0] IRI-to-CC-Correlation,
```

```
        iri-IRI [1] IRI-to-IRI-Correlation}
```

```
    }
```

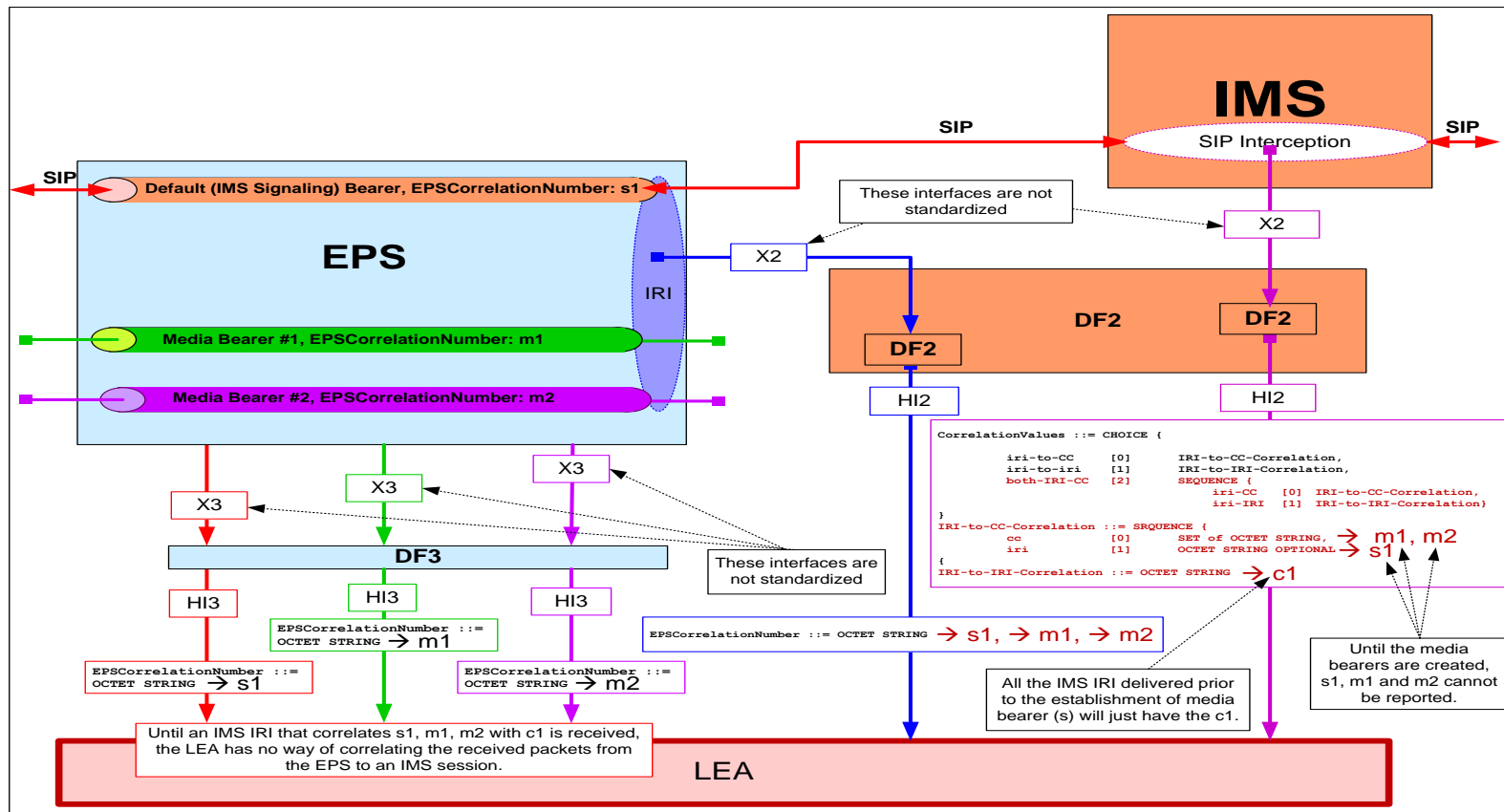
```
IRI-to-CC-Correlation ::= SEQUENCE {
```

```
    cc      [0]    SET of OCTET STRING,
```

```
    iri     [1]    OCTET STRING OPTIONAL
```

```
    }
```

```
IRI-to-IRI-Correlation ::= OCTET STRING
```



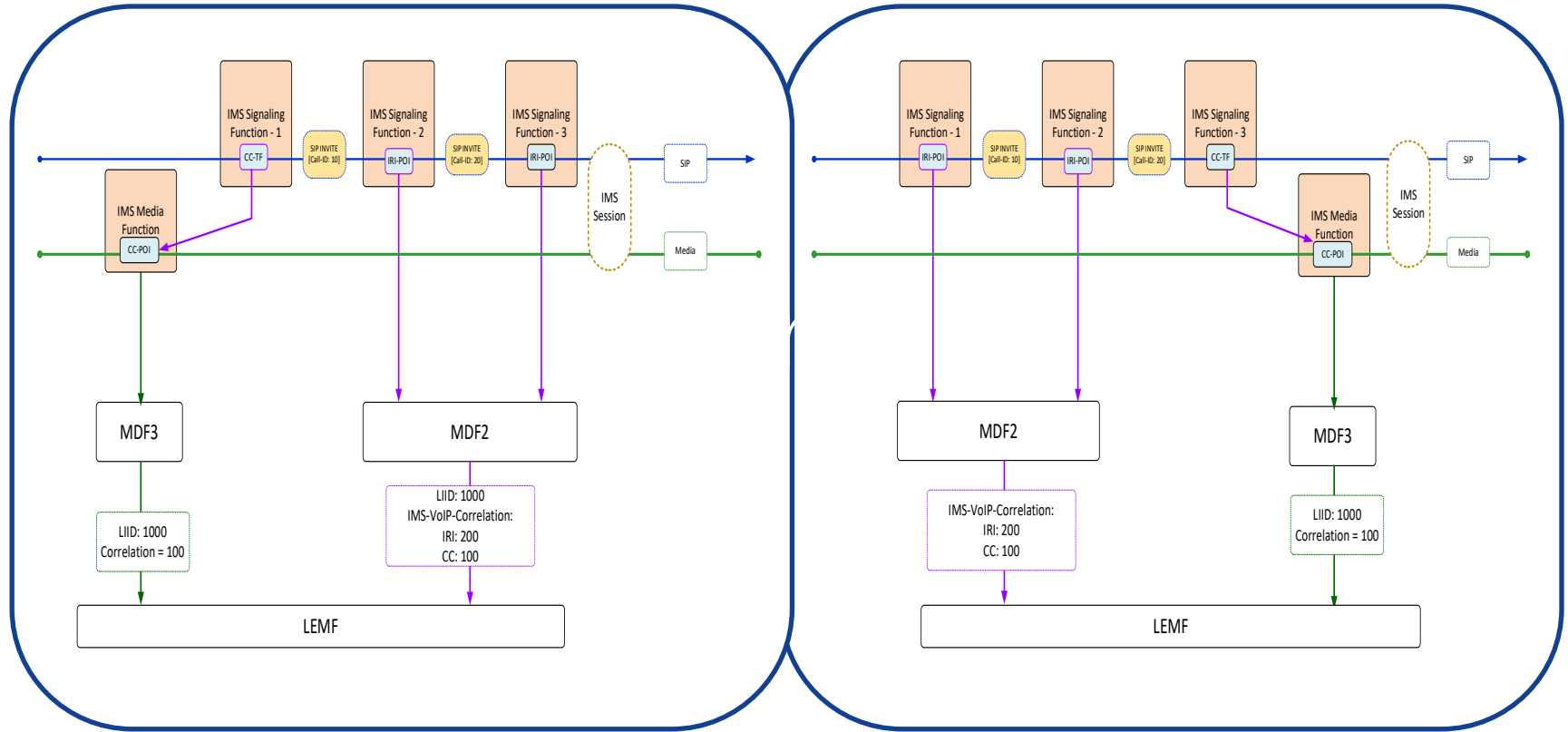
TS 33.108 – changes to cover IMS media

For the delivery of CC, the CC Intercept Triggering Function provides the Correlation Number to the CC Intercept Function. This Correlation Number is delivered to the LEMF on the handover interface HI3 and is also delivered to the LEMF on the handover interface HI2.

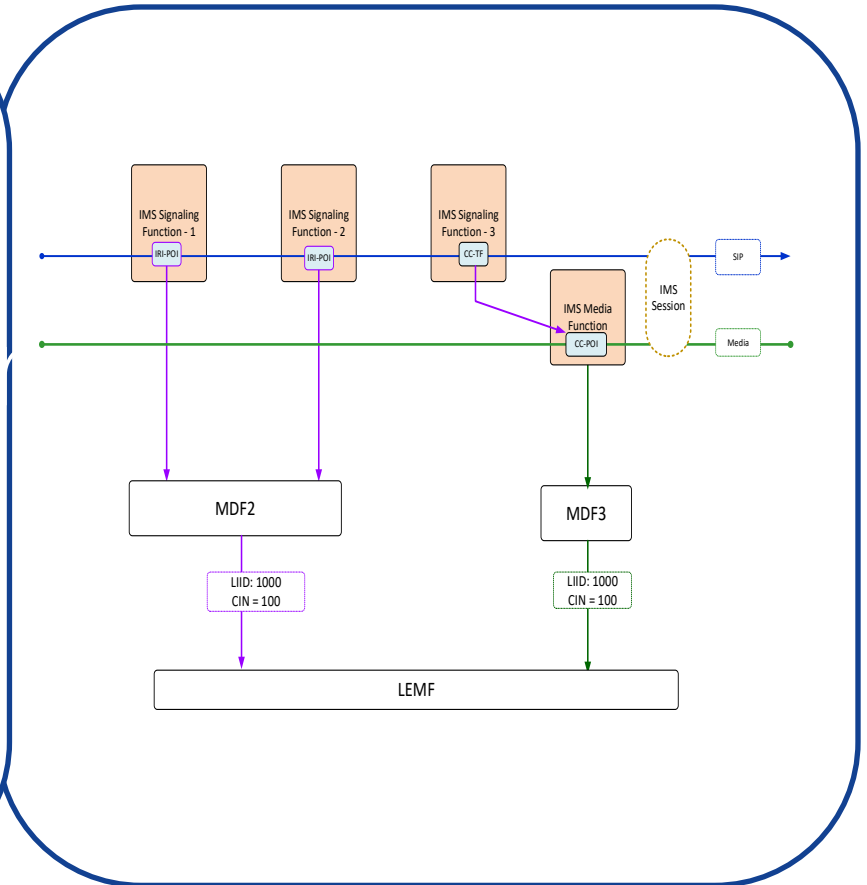
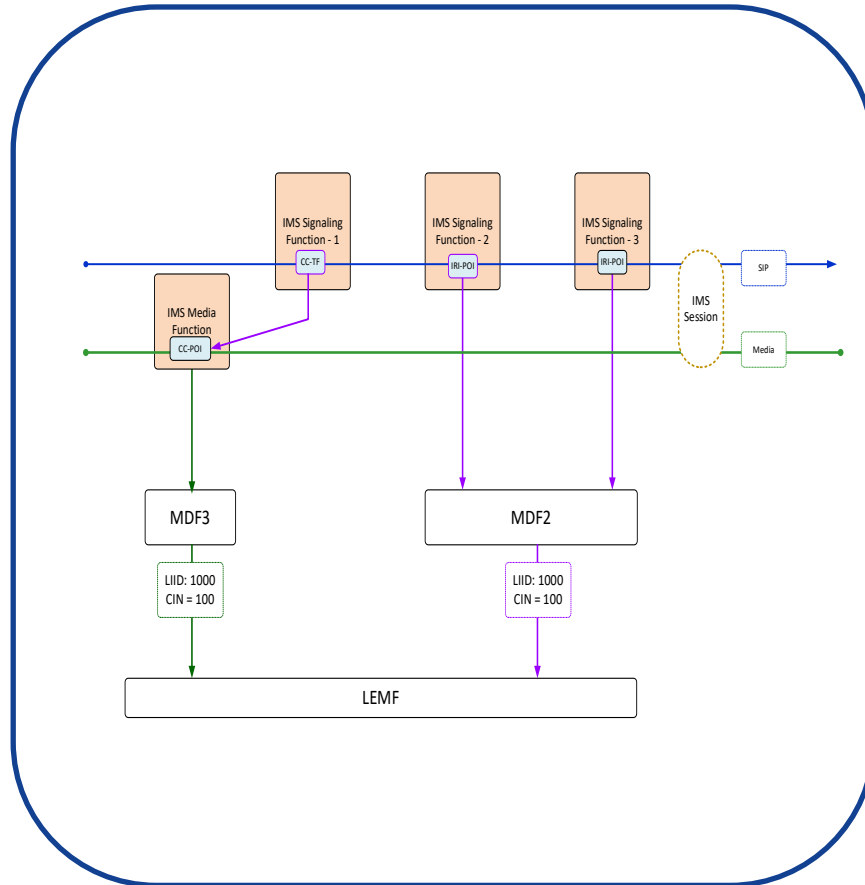
The IMS-VoIP-Correlation delivered to the LEMF on the HI2, contains the Correlation Number (s) used for the IRI messages as ims-iri (IRI-to-IRI-Correlation) and Correlation Number (s) used for the CC data as ims-cc (IRI-to-CC-Correlation). The LEMF shall interpret that the IRI messages and the CC data containing those Correlation Number values belong to the one single IMS VoIP session.

imsVoIP	[46]	IMS-VoIP-Correlation	OPTIONAL,
IMS-VoIP-Correlation ::= SET OF SEQUENCE {			
ims-iri	[0]	IRI-to-IRI-Correlation,	
ims-cc	[1]	IRI-to-CC-Correlation	OPTIONAL
}			
IRI-to-CC-Correlation ::= SEQUENCE { -- correlates IRI to Content			
cc	[0]	SET OF OCTET STRING,	-- correlates IRI to multiple CCs
iri	[1]	OCTET STRING	OPTIONAL
-- correlates IRI to CC with signaling			
}			
IRI-to-IRI-Correlation ::= OCTET STRING -- correlates IRI to IRI			

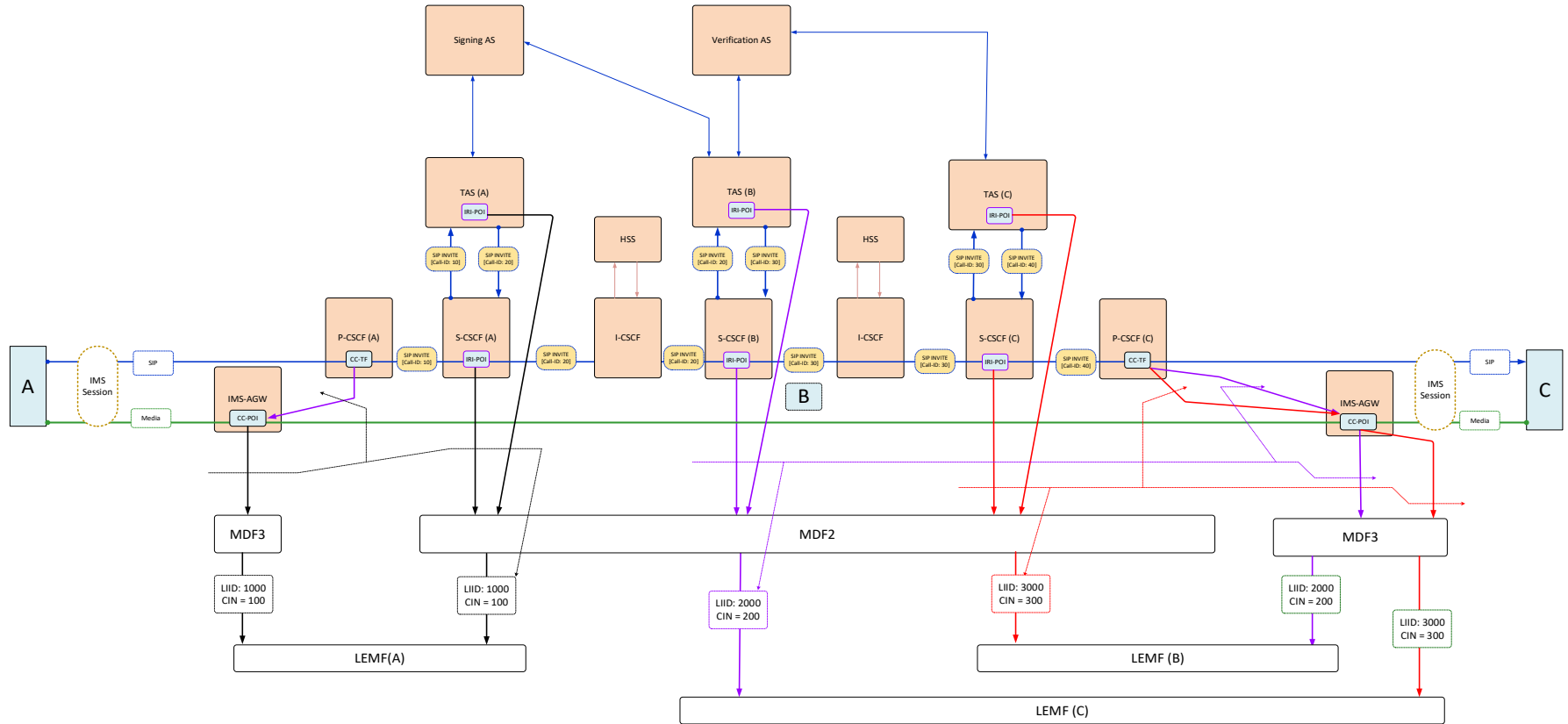
The summary of TS 33.108: X-interfaces are undefined



TS 33.128 has the CIN on LI_HI2 and LI_HI3



IMS requirement can be complex

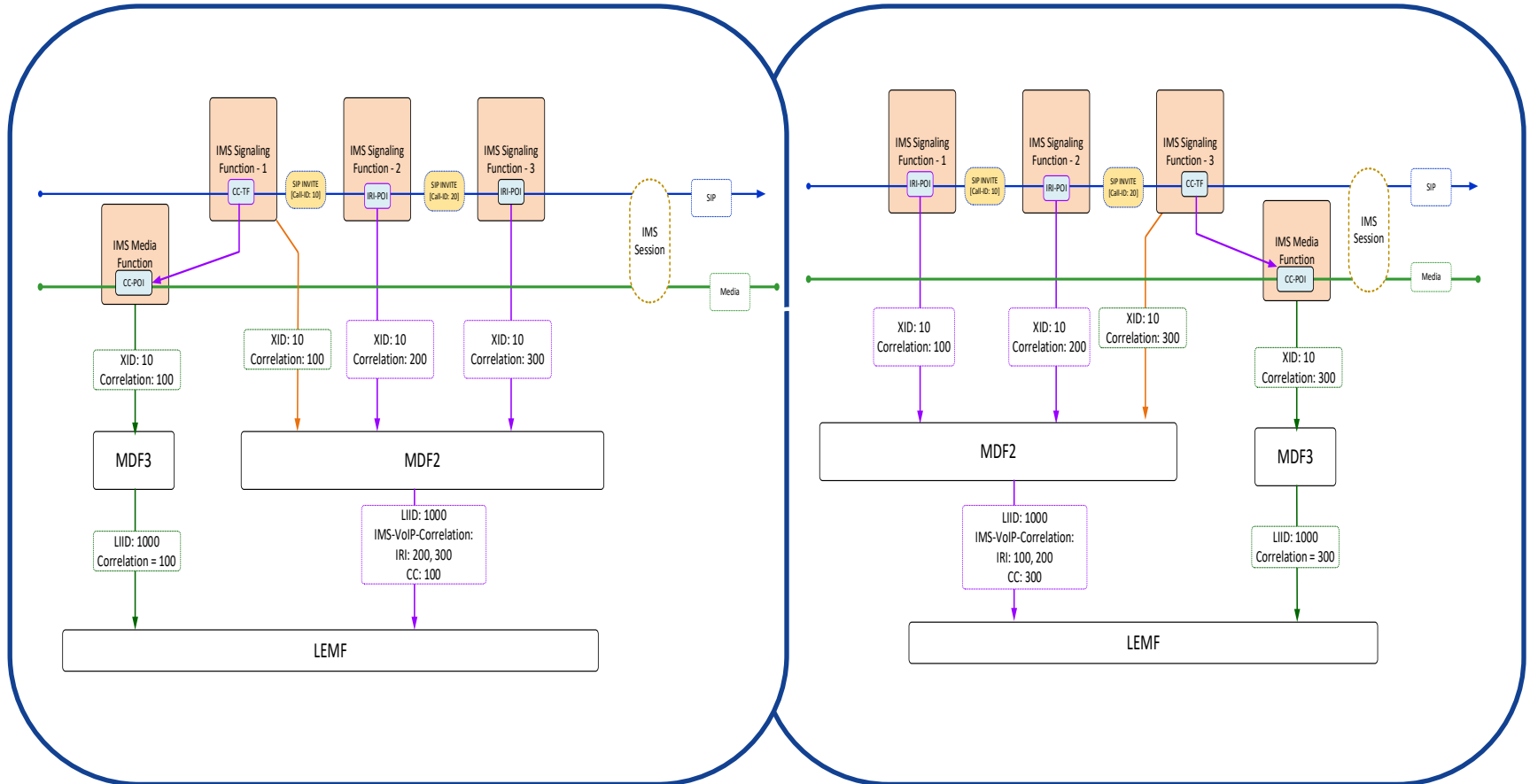


xIRIs from IRI-POIs present in multiple NFs
and xCC may have to be correlated

Analysis

[TS 33.108 approach on
LI_HI2/LI_HI3]

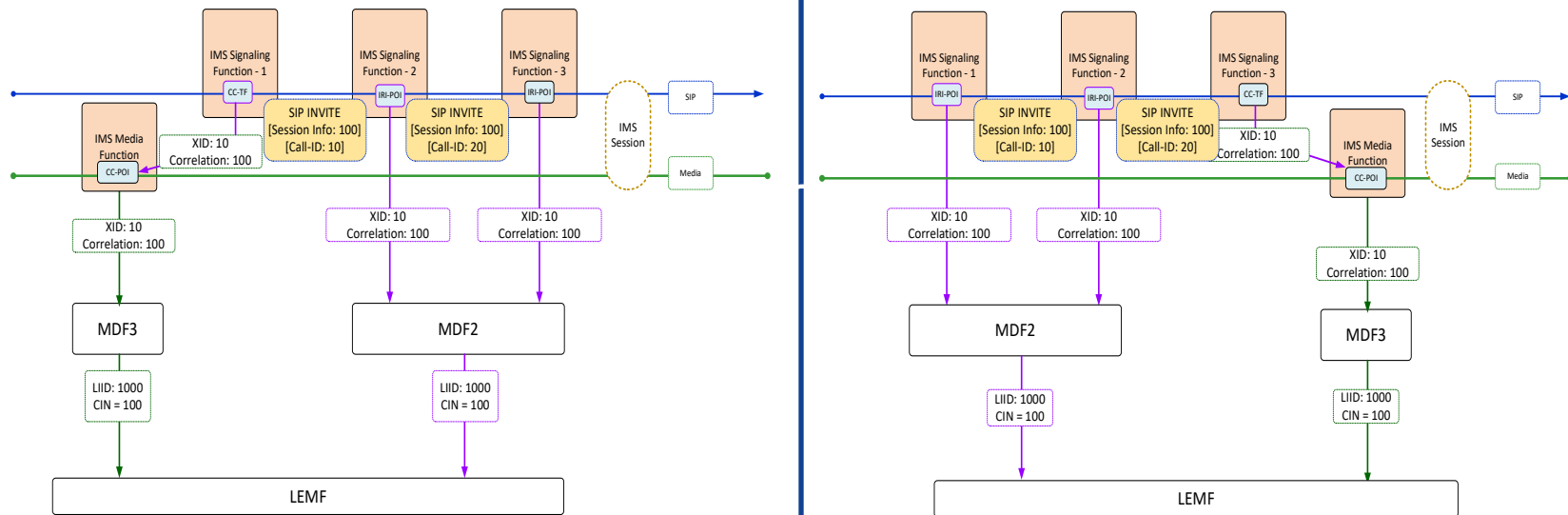
Extending the TS 33.108 HI2/HI3 to TS 33.128 LI_HI2/LI_HI3



Analysis

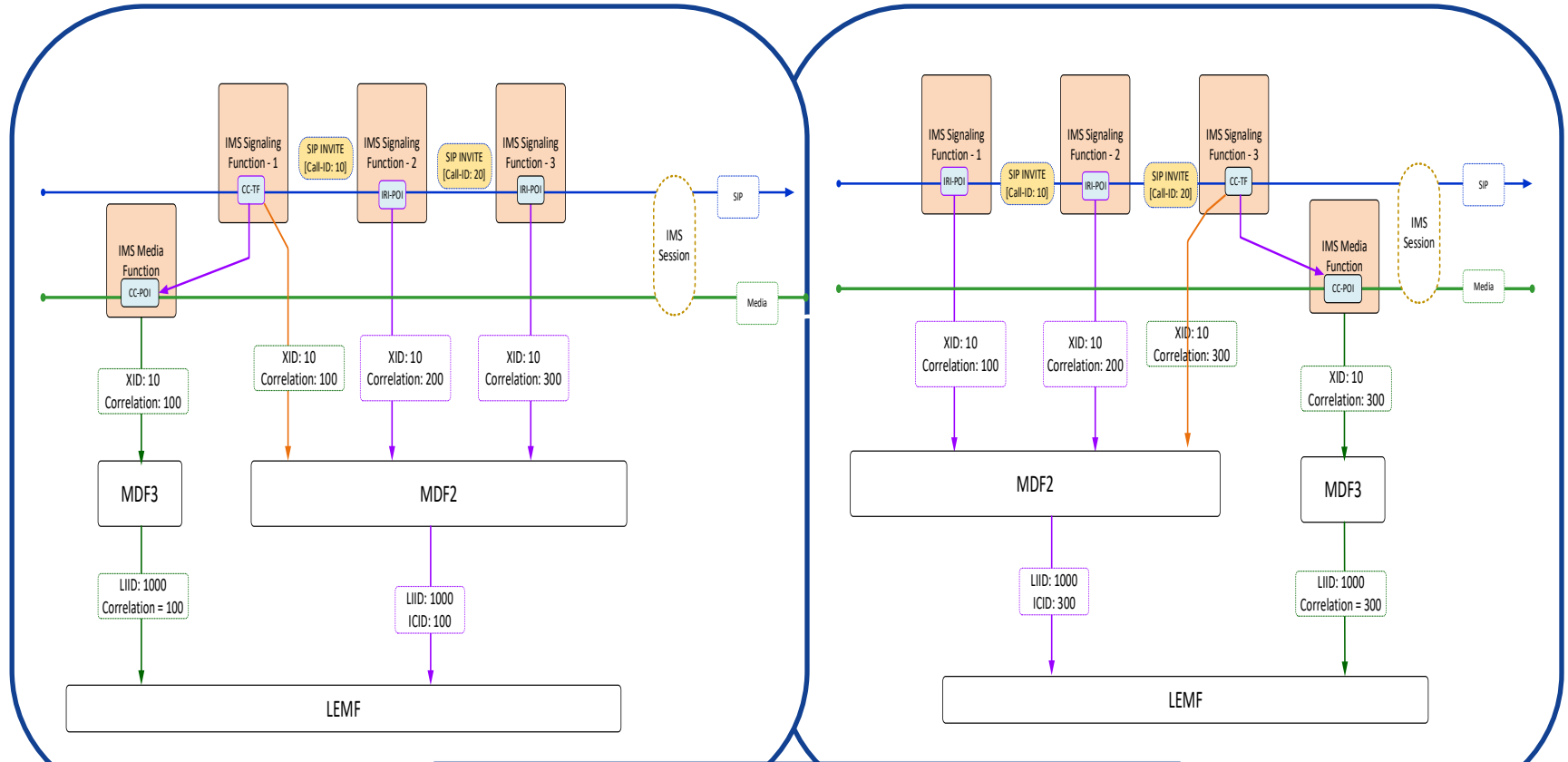
[Using TS 33.128 CIN on
LI_HI2/LI_HI3

Method 1: Transfer Correlation Number in a SIP header e2e within the CSP domain



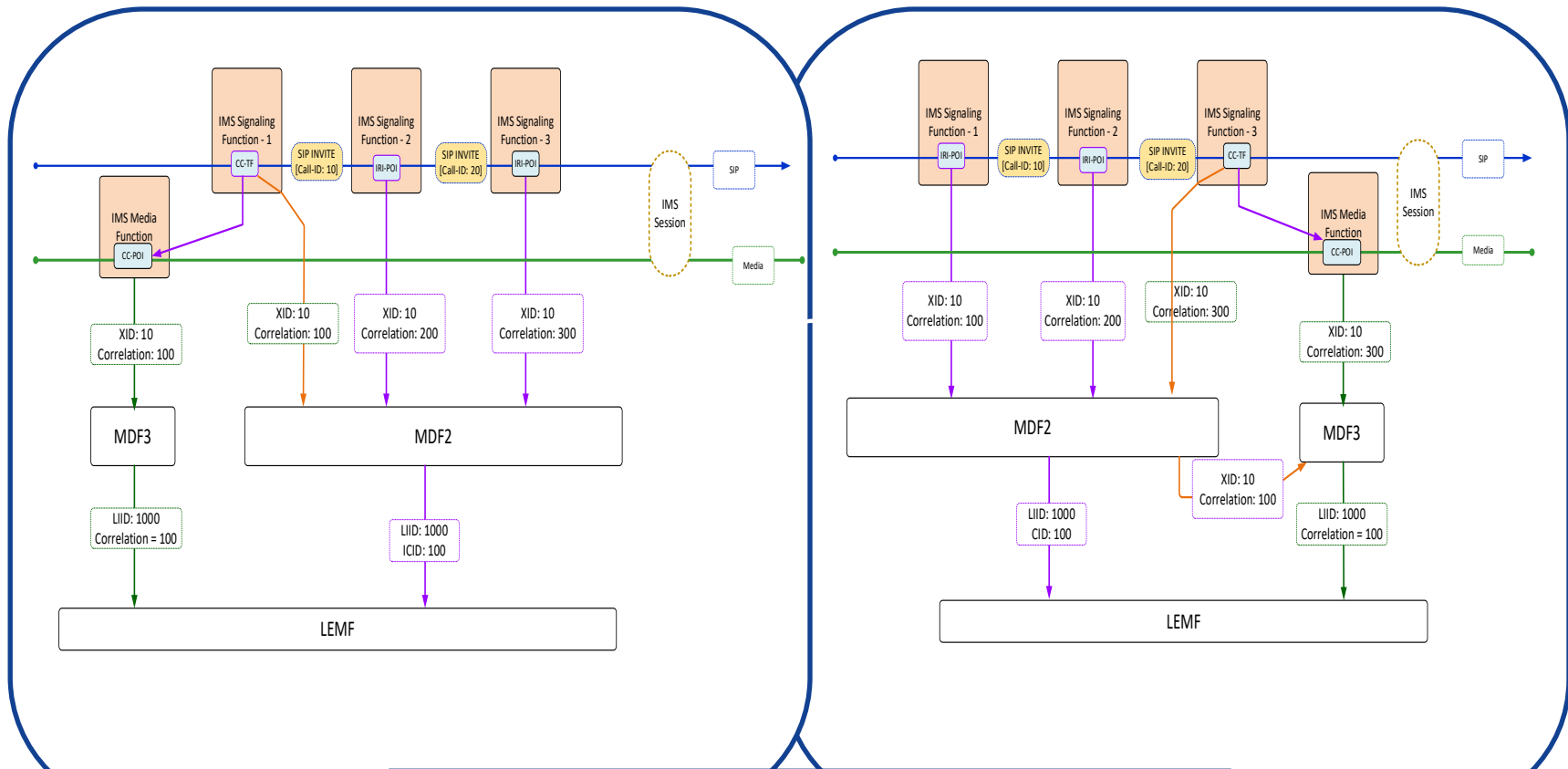
This requires changes to SIP procedures (IETF, CT1)

Method 2: POIs use independent Correlation Numbers, MDF2 coordinates



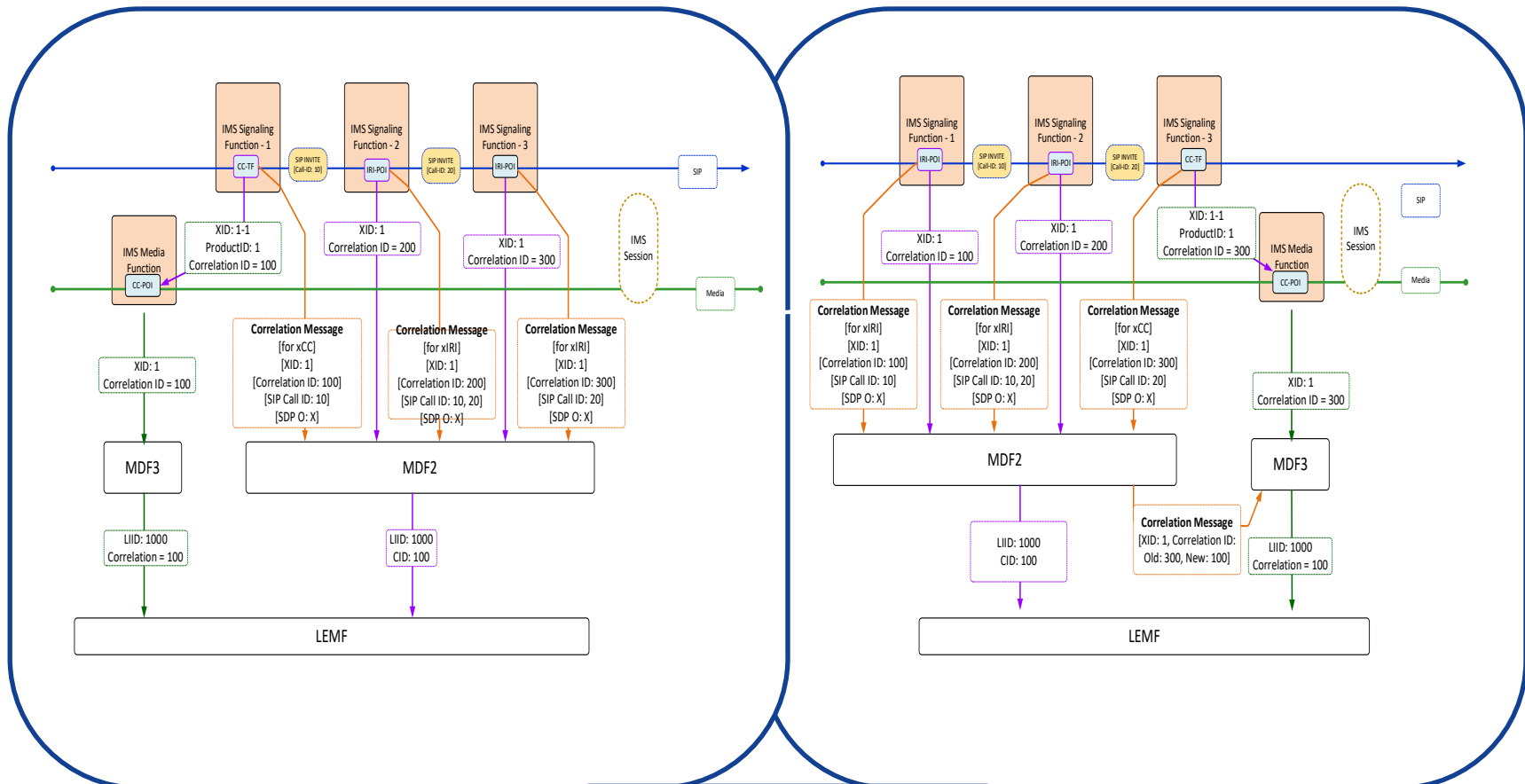
This requires a message from CC-TF to MDF2
Terminating calls may have an issue

Method 3: POIs use independent Correlation Numbers, MDF2/MDF3 coordinate

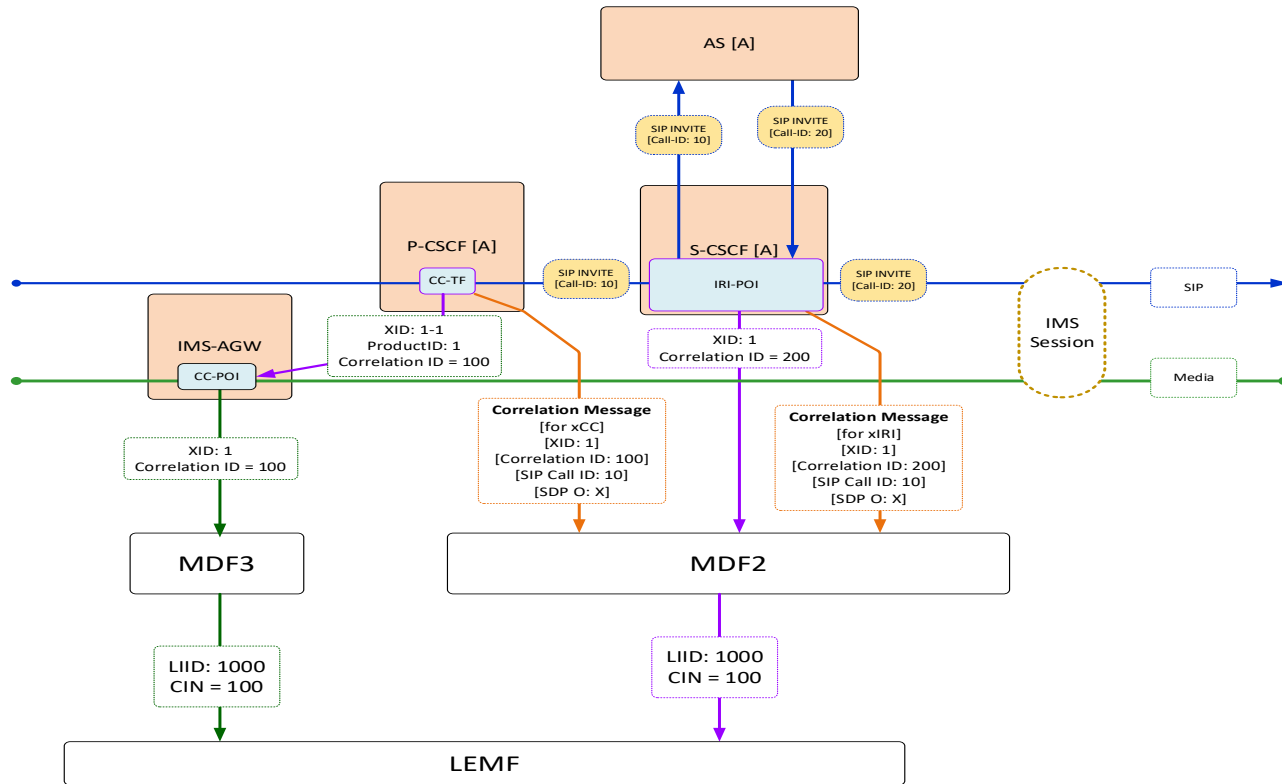


Same as Method 2 with MDF2 to MDF3 interaction

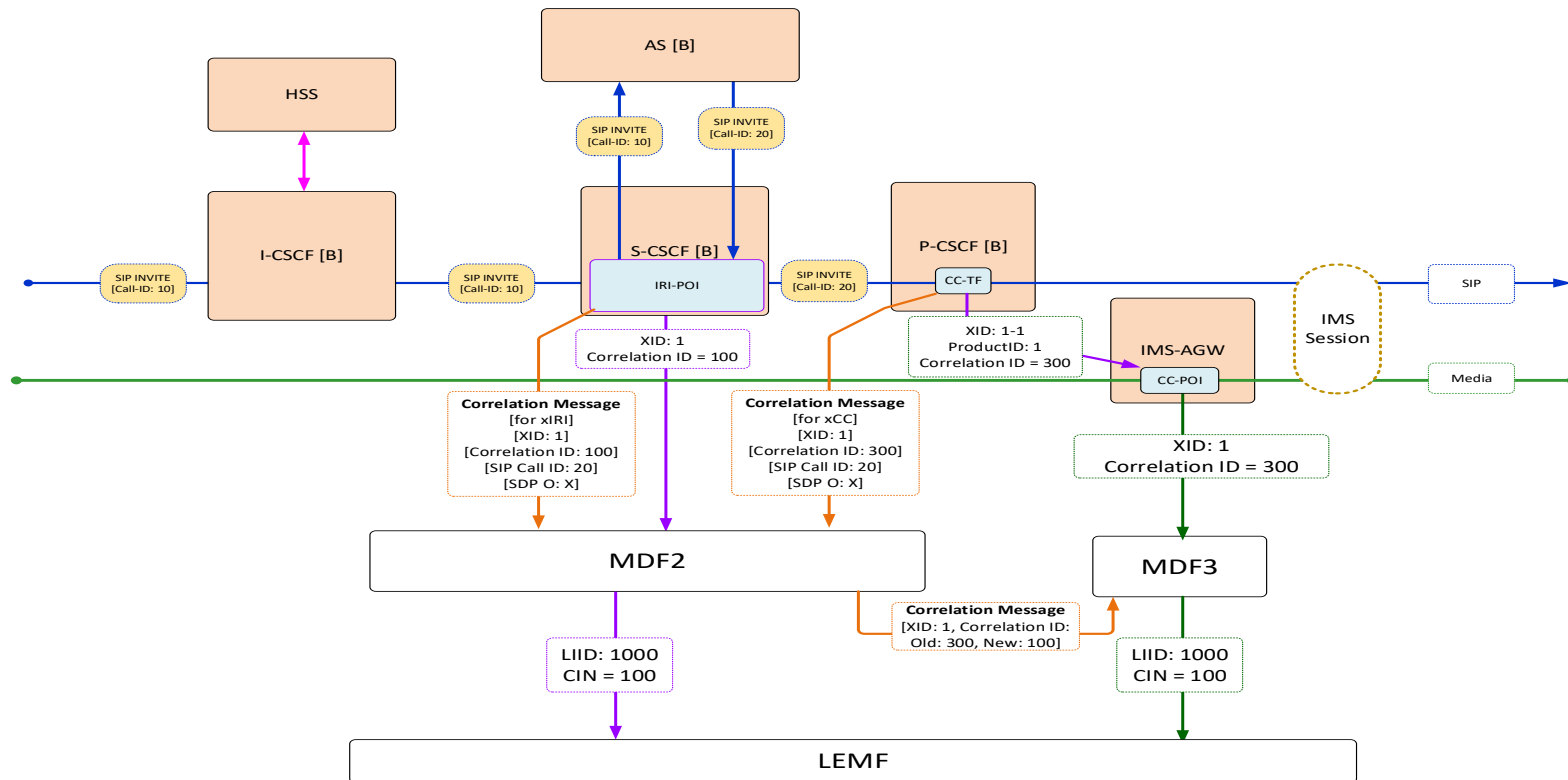
Method 3 realization: Correlation Message from CC-TF/POI to MDF2



An example: originating end



An example: terminating end



Summary

Correlation Message from CC-TF to MDF2:

- For xCC
- XID
- Correlation ID used on LI_X3
- SIP Call ID
- SDP Offer

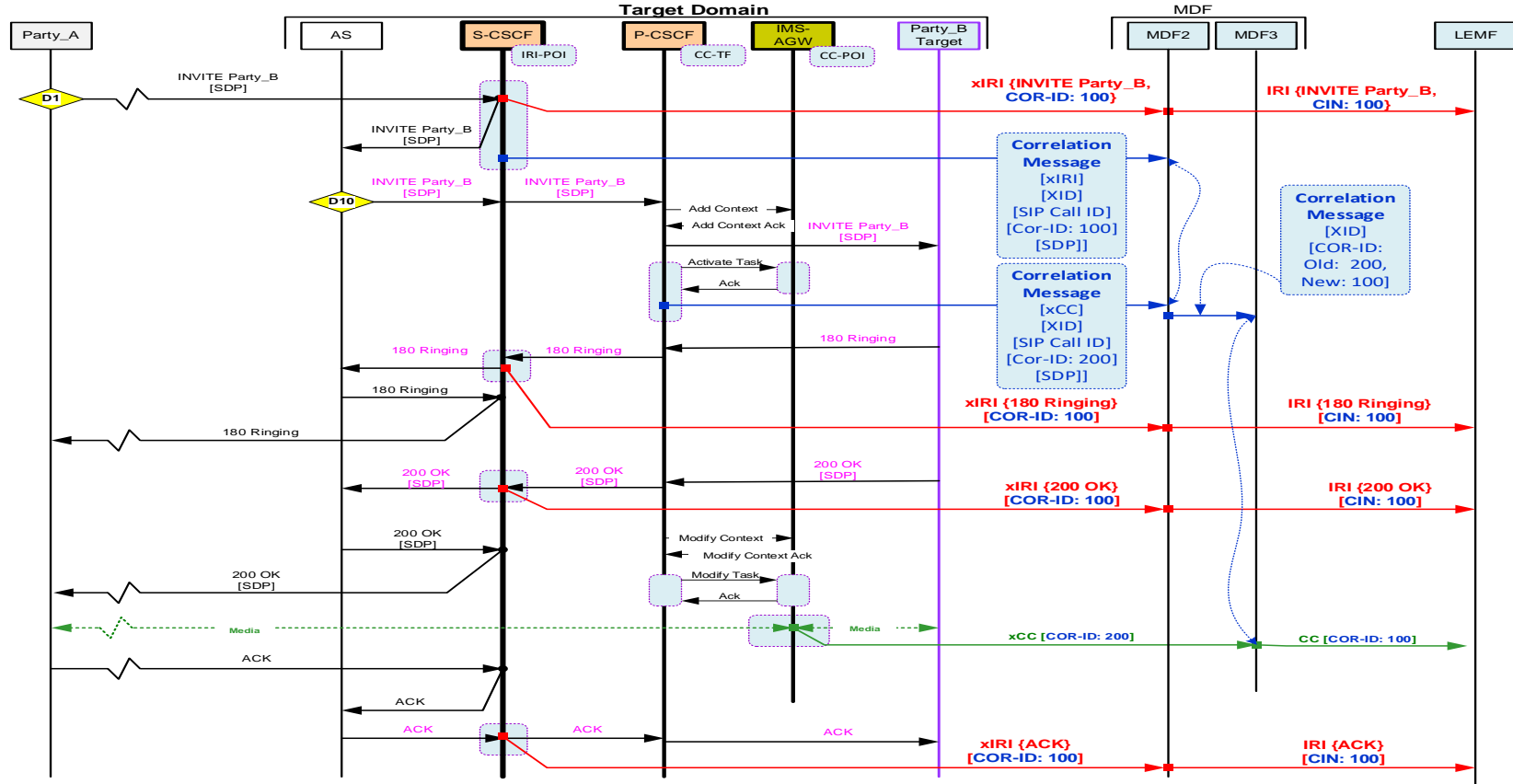
Correlation Message from IRI-POI to MDF2:

- For xIRI
- XID
- Correlation ID used on LI_X2
- SIP Call ID
- SDP Offer

Correlation Message from MDF2 to MDF3:

- XID
- Old Correlation ID used on LI_X3
- New Correlation ID to be used on LI_HI3.

An example flow-diagram (terminating call – TR 33.929)



NOKIA