VoLTE
SRVCC
Single Radio Voice Call Continuity
What is **SRVCC** (Single Radio Voice Call Continuity)

There will be areas without LTE coverage in every network.

3GPP TS 23.216

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Evolution of Voice Call

- **2G Radio**
  - 1992: CSFB call on 3G

- **3G Radio**
  - 2000: 3G Network - VoLTE Call on 4G
  - 2008: VoLTE + SRVCC

- **4G Network - CSFB call on 3G**
  - 2012: VoLTE + SRVCC + eSRVCC + aSRVCC

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**Abbreviations**

- **CSFB**: Circuit Switched Fall Back
- **VoLTE**: Voice over LTE
- **SRVCC**: Single Radio Voice Call Continuity
- **eSRVCC**: Enhanced SRVCC
- **aSRVCC**: Alerting SRVCC

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Various Approach to Voice Calls

**CSFB**

- Voice Call start in underlying 2G, 3G Radio
- Every Voice Call in Non-VoLTE N/W

**VoLTE + SRVCC**

- 4G Coverage Holes
- Moving User going into LTE Coverage Hole in VoLTE N/W

**Service Based Handover**

- CSFB: Circuit Switched Fall Back

**VoLTE Network**

- 4G IMS

**Non-VoLTE Network**

- TEMPORARY SOLUTION

**Call Quality**

- Setup Time
- Less Resources
## Evolution of SRVCC

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*GSMA IR.64*

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How it works

Service Continuity

LTE Network

MME

SGW, PGW

ok Sir

IMS

B Party

MSC

Sv

2G/3G Network

3GPP TS 29.280

Voice Path

New Voice Path

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SRVCC Call flow

Handover Preparation Flow

1. Measurement reports
2. Decision for HO
3. Handover Required
4. Bearer Splitting
5a. PS to CS Req
5b. Prep HO
6. Forward Reloc Req
6a. Forward Reloc Resp
7a. Reloc / HO Req Ack
7b. Forward Reloc Resp
8a. Reloc / HO Req Ack
8b. Prep HO Resp
9. Initiation of Session Transfer (STN-SR or E-STN-SR)
10. Session transfer and update remote leg
11. Release of IMS access leg
SRVCC Call flow

1. Measurement reports

2G/3G Network

4G EnodeB

MME

SGW / PGW

IMS

B Party

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SRVCC Call flow

1. Measurement reports
2. Handover Required

2G/3G Network

SGSN

MME

SGW / PGW

MSC

4G EnodeB

B Party

IMS

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SRVCC Call flow

2G/3G Network

SGSN

Forward Relocation Req

MME

SGW / PGW

PS to CS Req

4G EnodeB

Measurement reports

Decide

Handover Required

MSC

Relocation HO Req

B Party

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SRVCC Call flow

2G/3G Network

MME

4G EnodeB

Measurement reports

Handover Required

SGW / PGW

PS to CS Request

PS to CS Response

Go to 3G

Relocation HO Req

Forward Relocation Req

Ack

Release of IMS access leg

Session Transfer (STN-SR or E-STN-SR)

MSC

Relocation HO Req

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SRVCC Call flow

UE tunes to UTRAN/GERAN

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SRVCC Call flow

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Handover Execution Flow
SRVCC Call flow

- 2G/3G Network
- MSC
- SGSN
- 4G EnodeB
- MME
- IMS
- B Party

Handover Complete
Relocation
PS to CS Complete/Ack

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SRVCC Call flow

2G/3G Network

MSC

SGSN

IMS

2G/3G Network

4G EnodeB

TMSI Reallocation

MME

Forward Reloc Complete

Update Bearer PGW

Reloc/HO Complete

PS to CS Complete/Ack

Reloc/HO Complete

Update Loc

New Voice Path

B Party

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SRVCC Identities

**Session transfer number for SRVCC (STN-SR)**
- Used for Session Transfer of Call to CS Domain
- E.164 Nomenclature (Similar to MSRN)
- Flow
  - HSS -> MME (s6, Attach Flow)
  - MME -> MSC (Sv, PS->CS Req)
  - MSC -> IMS (Voice Call)

**Correlation MSISDN (C-MSISDN)**
- Used for correlation of sessions at access transfer
- MSISDN of User in CS Network
- Helps to Identify Session to be Transferred

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Network Changes required for **Enabling SRVCC**

- **ATCF**
- **ATGW**
- **MSS**
- **E-UTRAN**
- **MME**
- **HSS**
- **SR-VCC-IWF**
- **SCC-AS**

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Enhanced SRVCC (eSRVCC)

Benefits of eSRVCC

- Interruption Time Reduced
  - SRVCC: 800-1000 ms
  - eSRVCC: < 300 ms

Changes Done for eSRVCC

- Anchoring Point Change
  - SRVCC: Home SCC-AS (Call Must Go Back to Home Network for Roamers)
  - eSRVCC: Serving Network ATCF/ATGW (Call can be Switched in Visited Network Itself – This Saves Time)

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Anthony J. D'Angelo

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