1   *3GPP2 S.R0136-0*

2   *Version 1.0*

3   *Version Date: 30 Oct 2008*

4

5

6

7

8

9

10   # System Requirements for MSC Pool

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

26

1 ***EDITOR***

2

3 Zhiming Li, Huawei, lizhiming@huawei.com

4

5 ***REVISION HISTORY***

6

REVISION HISTORY		
Version 1.0	*Initial publication*	*30 Oct,2008*

Table of Contents

List of Tables

None.

List of Figures

1

2   None

1

1   INTRODUCTION AND SCOPE

This document specifies the requirements necessary to support MSC Pool in the CDMA2000®[1] wireless network. MSC Pool enables signaling connections between one BSC with multiple MSCs, so the MS served by any BSC of that pool area can be served by any MSC in that pool area.. MSC Pool is built upon to the Legacy Mobile Station Domain architecture.

Serving Node Selection Function (SNSF) is the key functionality for MSC Pool application. The main function of SNSF is selecting a serving MSC within MSC Pool for a given user, and routing the signaling between the MSC and the BSC.

2   REFERENCES

Unless explicitly stated in the reference, references are to the latest revision, addendum, version, or date. The document references which are applicable to this specification include the following:

2.1   Normative Reference

[1.] 3GPP2 N.S0005-0 v1.0, X.S0004-E v1.0, "Radiotelecommunications intersystem Operations", July 1997

[2.] 3GPP2: A.S0011~14-D v1.0, Interoperability Specification (IOS) for cdma2000 Access Network Interfaces, July 2007.

2.2 Informative References

None.

3   DEFINITIONS AND ABBREVIATIONS

The terms and abbreviations which are used within this specification are defined as follows:

MSC pool: An MSC Pool is a set of MSCes to which a set of BSCs can connect.

---

[1] cdma2000® is the trademark for the technical nomenclature for certain specifications and standards of the Organizational Partners (OPs) of 3GPP2. Geographically (and as of the date of publication), cdma2000® is a registered trademark of the Telecommunications Industry Association (TIA-USA) in the United States

1   Pool Area: A Pool Area is a geographical area which consists of radio
2   coverage of a set of BSCs connected to an MSC pool. Within the Pool area,
3   an MS does not need to change the serving MSCe.

4

BSC	Base Station Controller
HRPD	High Rate Packet Data
LMSD	Legacy MS Domain
LAC	Location Area Code
MS	Mobile Station
MSC	Mobile Switching Center
MSCe	Mobile Switching Center Emulator
PA	Pool Area
SNSF	Serving Node Selection Function

5

6 **4   GENERAL FEATURE DESCRIPTION**

7   MSC Pool feature uses per-user signaling connections between a BSC
8   and any one MSCe within the MSC pool with the aid of SNSF. This allows
9   a more flexible network topology, so if an MSCe goes out of service, it
10   does not cause an entire geographic area assigned to that MSCe to be out
11   of service.

12   For an MS which registers in a Pool Area (PA), the SNSF will select a
13   serving MSCe. The MS is served by this serving MSCe as long as it is
14   within the PA until load redistribution occurs. When load redistribution
15   is needed (e.g., when a MSCe is maintained or upgraded by the operator,
16   is overloaded, or breaks down), the load associated with the MSCe will be
17   redistributed to other MSCes. All SNSFs in the PA do not assign any load
18   on the MSCe until it is recovered. MSC Pool feature is not intended to be
19   supported between and amongst multiple operators. For certain operator
20   scenarios, for the purpose of load re-balance, the re-registration may be
21   required.

22

23 **4.1   Scenarios for MSC Pool**

24   This section gives some scenarios when a network operator will wish to
25   apply the MSC Pool mechanism.

26

Scenario 1: When a Mobile Station (MS) moves within the Pool Area, the serving MSCe need not change. Hence the signaling traffic of re-registration could be reduced.

Scenario 2: Core network can be expanded easier and can be scaled between the radio network and core network. For example, operator could expand Core Network capacity by only introducing a new MSCe without new BSC(s). Additionally, side benefit is load balance.

5   DETAILED REQUIREMENTS

The requirements contained in this section may be implemented in a phased manner during the development of the stage 2 and stage 3 specifications.

5.1   System Requirements

SYS-01:   It shall be possible to connect between SNSF and any MSCe in the Pool

SYS-02:   An MSCe within the MSC pool shall be able to support both MSC pool configuration and legacy configuration.

SYS-03:   A BSC within the MSC pool configuration shall be able to support both MSC pool configuration and legacy configuration.

SYS-04:   SNSF shall be able to select an MSCe as a serving MSCe for a subscriber within the MSC Pool configuration based on a selection algorithm which include the load redistribution capability.

SYS-05:   It shall be possible for the operator to choose the selection algorithm used by SNSFs.

SYS-06:   An MS shall be served by a selected MSCe, known as the default MSCe, for the life of the registration within the PA even if the MS crosses the BSC boundary within the MSC Pool area.

SYS-07:   it shall be possible to redistribute the MSs from the current serving MSCe/failure MSCe to a new serving MSCe within the MSC pool, a new serving MSCe provides the functions decribed in SYS-06.

SYS-08:   MSC Pool network entities shall be able to interoperate with non-MSC Pool network entities without any impact on the non-MSC Pool network entities (e.g., trunking group procedures, handoff procedures).

SYS-09: This feature shall not create any impacts to deployed non-MSC Pool network interfaces or entities that support [1].

SYS-10: Deployment of this feature shall be possible such that adjacent non-MSC Pool MSCs can interoperate with MSC Pool MSCes without modification of procedures of the non-MSC Pool entities.

SYS-11: It shall be possible to deploy this feature in such a way that an HRPD system that spans both the MSC Pool Area and non-MSC Pool Area can operate without modification, and without modification to standard procedures for handoff from HRPD to cdma2000 1x.

SYS-12: Introduction of MSC pool shall not impact any of the existing Circuit Switched (CS) services supported by current IOS specification[2]

SYS-13: MSC Pool shall support legacy cdma2000 1x MS.

5.2 Operation, Administration, Maintenance and Provisioning Requirements

OAM&P-01: The OAM&P system shall be able to trigger load redistribution from one MSCe to other MSCe(s) in the MSC Pool.

OAM&P-02: It shall be possible to allow the BSC to be configured with a new SNSF when the current SNSF is unavailable.

5.3 System Design Goals

GOALS-01: When one MSCe in an MSC Pool breaks down, the interruption time for users being registered in this MSCe should be minimized. In other words, other MSCe within the MSC Pool shall take over the communication services (e.g., call origination, call delivery, etc.) from this MSCe as quickly as possible.

GOALS-02: The SNSF should consider load balancing when selecting a serving MSCe.