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10 *Fast Call Set-up*

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12 *System Requirements*

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# 1 INTRODUCTION

This document specifies the system requirements for Fast Call Setup. This feature allows accelerated process in call setup (bearer resource assignment), which is particularly beneficial when a connection is returned from dormancy as a result of a packet arrival to the wireless network. The feature can be considered as falling into the category of standing requirements for network performance improvement.

The objective is to define and to standardize the functionality of this capability that can be incorporated into the operations of cdma2000 based wireless telecommunications networks.

The Fast Call Setup feature is a set of enhancements/mechanisms that reduce the latency involved in MS terminated and MS originated call setup.

Call setup involves a set of signaling message exchange between the Mobile Station, Base Station, and the Network in order to allocate resources and allow user communication to proceed. Each step of this process introduces delay that contributes to the end-to-end call setup latency. Enhancements that reduce the delay in each step of this process and enhancements that streamline this process result in reduced call setup latency which is beneficial to cdma2000 services.

Examples of potential enhancements include the following:

- For MS terminated calls, the current cdma2000 standard requires that the MS must first be paged before the BS can send the channel assignment. An enhancement is to allow the BS to bypass paging and send the channel assignment directly to the MS.
- In cdma2000 systems, when a call is setup is initiated, service configuration parameters must be negotiated before user traffic can be exchanged. In Release A, a capability was added to store this negotiated service configuration for future use without requiring re-negotiation. But currently after channel assignment, a special message must be sent to the MS to indicate use the stored configuration. An enhancement is to indicate this information at channel assignment rather than via a special message after the channel assignment, thus eliminating the need for an additional message.
- Currently MS originated calls are initiated by sending an Origination Message which was designed to handle originating various types of calls such as circuit calls, packet calls, etc. As such it contains fields that are a superset of fields required for each type of call setup. With the increased importance and use of packet data calls, many of the originations in a system are associated with bringing a dormant packet data service back to active state. When reconnecting a dormant call, only a small subset of the fields in the Origination Message is required. An enhancement is to create a short message that carries the minimally required fields for reconnecting a dormant packet data call.

1 Due to the benefits to the cdma2000 services, enhancements to allow Fast Call Setup  
2 should form a “standing requirement” in development of cdma2000 standards.

## 3 **2 REFERENCES**

- 1 3GPP2 C.S0005-B, Upper Layer (Layer 3) Signaling Standard for cdma2000  
Spread Spectrum Systems, December 2001
- 2 TIA-2001-B, Interoperability Specification (IOS) for cdma2000 Access Network  
Interfaces, December 2001
- 3 TIA/EIA-41-D, Cellular Radiotelecommunications Intersystem Operations,  
December 1997.
- 4 3GPP2 P.S0001-B, Wireless IP Network Standard, Dec. 2001.

## 5 **3 DEFINITIONS AND ABBREVIATIONS**

6 **Call Origination.** The act of mobile station initiating a call to the network. This is  
7 achieved via the Origination Message over the air interface.

8 **MS originated call setup.** A call originated by a mobile station user.

9 **MS terminated call setup.** A call is destined to a mobile user.

10 **Paging.** The act of seeking a mobile station when a call has been placed to that mobile  
11 station. This is achieved via the General Page Message or the Universal Page Message  
12 over the air interface.

13 **Service Configuration.** The common attributes used by the mobile station and the base  
14 station to build and interpret Traffic Channel frames. Service configuration corresponds  
15 to the parameters contained in the Service Configuration information record and the Non-  
16 negotiable Service Configuration information record. Examples of such parameters  
17 include Forward and Reverse Traffic Channel multiplex options, Forward and Reverse  
18 Traffic Channel transmission rates, service option connections, and reverse pilot gating  
19 rate.

20 **Service Negotiation.** The procedures used by the mobile station and base station to  
21 establish a service configuration. The final step of completing a service negotiation  
22 involves sending a Service Connect Message from the base station to the mobile station  
23 over the air interface.

## 24 **4 HIGH LEVEL SYSTEM REQUIREMENTS**

### 25 **4.1 General**

#### 26 **FCS–1 Call Acceleration**

27 Fast Call Setup procedures shall reduce the delay in one or more steps of the call setup  
28 process. The following examples may be considered:

- 29 1. Allow the network to assign traffic channel to the mobile station without first paging  
30 the mobile station, if the network knows with a high degree of certainty the location

- 1 and availability of the mobile station (e.g. which base station's control channel is  
2 monitored by the mobile station)
- 3 2. Indicate to the mobile station at the earliest possible time in the call setup procedures  
4 the intent to use stored service configuration, such as channel assignment rather than  
5 at service connection.
- 6 3. When performing packet reconnect, permit the mobile station to send the minimum  
7 amount of information to the base station that is required to bring a packet  
8 connection from dormant to active state.

9 The above set of call acceleration methods and techniques is not exhaustive. There may be  
10 other enhancements that reduce the delay in one or more steps of the call setup process and  
11 enhancements that streamline the call setup process.

## 12 **4.2 Security**

### 13 **FCS–2 Authentication of Reconnection of Dormant Data Call**

14 Reverse link control channel messages used for reconnecting a dormant data call shall be  
15 authenticated.

### 16 **FCS–3 Channel Assignments Without Paging**

17 When no dormant data connection exists, the mobile station shall reject a channel  
18 assignment received without prior paging.

### 20 **FCS–4 Authentication of Channel Assignments**

21 A means shall be available to authenticate the mobile station when it becomes active on a  
22 Traffic Channel as a result of a channel assignment without prior paging.

### 23 **FCS–5 Session Key After Channel Assignment**

24 After reconnecting a dormant data call, the mobile station and base station shall use the  
25 same session keys as were in use when the previous call became dormant.

## 26 **4.3 Tones, Announcements, and Indications to the User**

27 Existing methods and requirements shall apply.

## 28 **4.4 Billing Records (CDR) Requirements**

29 Existing methods and requirements shall apply.

## 30 **4.5 Applicability to Telecommunication Services**

31 Existing methods and requirements shall apply.

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