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CDMA Certification Forum™

A Concept Overview

26 April, 2004

rev 0.3

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Executive Summary

The CDMA Certification Forum TM, or CCF TM, is a partnership between CDMA operators and CDMA mobile station vendors to establish and maintain a core global terminal certification process that helps ensure terminal quality and network compatibility across the globe.

The primary initial overall objective of the CCF is to define and implement a core global handset certification process. There are several support objectives including;

- establishing the CDMA Certification Forum itself,
- reach global consensus on phased sets of features and functions that will help vendors to develop handsets that can roam across CDMA markets,
- define, document, and publish the test cases (based on industry standards) by which the handset will demonstrate compliance to achieve CCF certification,
- define and document the certification test process,
- educate operators and vendors on the certification test procedures and processes
- qualify test labs to conduct certification testing

It is just as important to note objectives that are outside the scope of the CCF including:

- to provide a comprehensive end-to-end handset test process inclusive of all carrier test requirements,
- to independently maintain test cases independent of recognized standards bodies,
- to determine which products or services must be recognized by CDMA operators

The CDMA Certification Forum is envisioned to encompass at least 4 main groups: the Operator Group, the Certification Group, the Technical Group, and the Vendor Group. The Operator Group as envisioned would include all CDMA network operators world-wide. This group will provide a leading role in defining the direction of the CCF. The Certification Group as envisioned would define the process by which a handset or test lab is certified. This group would be made up of representatives of certification bodies from each of the markets where CDMA is deployed. The Technical Group as envisioned is the engineering arm of the CCF. While the Certification Group defines the *process* by which handsets and labs are certified, the Technical Group defines the *technical requirements* in the form of *test cases* that are executed during that process. The Vendor Group as envisioned would include infrastructure vendors, handset vendors, test equipment vendors, and test houses. The Vendor group would work hand-in-hand with the Operator Group to establish the global handset specification.

The legal entity and fee structure by which the CCF will be established and operated is under consideration. The CDG nor the GCF is currently positioned to assume the burden of the CCF as proposed.

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1 Vision Statement

1.1 Mission

The CDMA Certification Forum TM, or CCF TM, is a partnership between CDMA operators and CDMA mobile station vendors to establish and maintain a core global terminal certification process that helps ensure terminal quality and network compatibility across the globe.

1.2 Objectives

The primary initial overall objective of the CCF is to define and implement a core global handset certification process. There are several support objectives:

The first objective is to establish the CDMA Certification Forum itself, defining clear goals & objectives for the first year of operation. The sub-groups that must be formed to realize these goals & objectives must be established at the earliest opportunity.

The second objective is to reach global consensus on phased sets of features and functions that will help vendors to develop handsets that can roam across CDMA markets, beginning with a core compatibility feature set that supports basic voice & data services in any market.

The third objective is to define, document, and publish the test cases (based on industry standards) by which the handset will demonstrate compliance to requirements of the Operator Group in order to achieve CCF certification. This would include by way of example lab-based and field-based test cases to verify minimum performance, signaling conformance, handset/infrastructure interoperability, and handset stability & performance tests.

The fourth objective is to define and document the certification test process. This includes not only stating the test process itself, but defining and implementing all the mechanisms that must be in place to execute that process. By way of example this would include establishing the certification criteria for test labs and packaging per the requirements of the regional certification bodies (e.g. A2LA, CNAL), establishing a team to physically administer the program (i.e. move handsets through the process), and creating a database of certified handsets.

The fifth objective is to educate operators and vendors on the certification test procedures and processes. This may take the form of formal classroom instruction to familiarize engineers with the relevant test specifications, followed by hands-on test training in the lab and in the field.

The sixth objective is to qualify test labs to conduct certification testing. This would involve providing documentation to a candidate test lab defining the certification process and the requirements to become an authorized lab, reviewing lab documentation

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as an initial step in evaluating their readiness to pass ISO-17025 requirements (including competency), conducting an on-site visit to evaluate first hand their abilities, procedures, and general lab disciplines, then granting certification status as appropriate. Longer term objectives would include implementing an audit mechanism to ensure continued compliance with existing and evolving test requirements.

1.3 Objectives NOT

It is not the objective or the intent of the CCF to provide a comprehensive end-to-end handset test process inclusive of all carrier test requirements. The CCF recognizes and appreciates the need for carriers to define handset test requirements over and above those of the CCF certification test process in order to meet the particular demands of their specific markets.

While the CCF may have the need to define specific test cases that are not covered in existing international standards, it is not the intent of the CCF to independently maintain these test cases. Test cases developed to meet the needs of the CCF certification test program will be submitted for publication in the appropriate international standard.

It is not the intent or the objective of the CCF to determine which products or services must be recognized by CDMA operators. Handsets or test labs certified by the CCF simply provide a known level of performance for participating operators' consideration in commercializing products.

2 Organization

The CDMA Certification Forum is envisioned to encompass at least 4 main groups: the Operator Group, the Certification Group, the Technical Group, and the Vendor Group.

2.1 Operator Group

The Operator Group as envisioned would include all CDMA network operators world-wide. This group will provide a leading role in defining the direction of the CCF. The initial focus of this group would be to define and publish a global feature specification, handset test requirements, and handset certification requirements.

2.1.1 Charter

Through a leadership role in the CCF, the charter of the Operator Group would be to collectively define and maintain a minimum core set of feature and function requirements that will provide handset vendors the greatest practical opportunity develop terminals with that help enable roaming across CDMA markets. To help ensure compatibility with these core features and functions, the Operator Group would provide a common set of terminal test requirements to vendor partners.

2.1.2 Roles & Responsibilities

The primary roles and responsibilities of the Operator Group would be to TBD.

2.1.3 Deliverables

Early deliverables for the Operator Group would include a global feature specification, handset and lab certification requirements, and a common global set of handset test requirements.

2.1.3.1 *Global Feature Specification*

The purpose of the Global Feature Specification would be to serve as a vehicle by which operators collectively identify, agree upon, and document a common set of features and functions that all handsets should be able to support in an effort to minimize differences across the industry and help enable global roaming. This document would consist of various independent modules that reflect the functionality required at all tiers of CDMA terminals. Operators would build upon this core document to reflect their own unique, custom requirements while maintaining consistent format and feature coverage.

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2.1.3.2 Global Test Requirements

The Global Test Requirements specification would be a companion to the Global Feature Specification, identifying high level requirements from the operator on how they expect compliance be demonstrated.

2.1.3.3 Certification Requirements

The Operator Group would provide a baseline set of requirements that handset vendors and handset test labs must meet in order for their products or services to even be considered by the participating operators. It would be the responsibility of the Technical Group and Certification Group to translate these baseline requirements into functional test requirements and certification process.

2.1.3.3.1 Handset Certification

The Operator Group would collectively define the set of requirements a handset must meet before entering their carrier specific test program. Handset certification requirements are envisioned to encompass the maximum practical suite of tests that can be performed in a cabled environment on commercially available test platforms, plus minimum necessary suite of tests that can be performed in an over-the-air environment on commercial networks.

2.1.3.3.2 Lab Certification

The Operator Group would collectively define the set of requirements a handset test lab must meet in order to be considered as a test resource for handset certification. Lab certification requirements are envisioned to include ISO-17025 compliance, which covers test processes and competencies.

2.1.4 Participants

Table TBD lists the CDMA operators who are currently active participants in the CDMA Certification Forum Operator Group.

Name	Organization	Email	Phone
Chenu Liu	BSI Atlanta		
James Person	CDG		
Eugene Kheifets	DELTA Telecom		
Makoto Tsukada	KDDI		
Yuji Sagae	KDDI		
Thomas Erickson	QUALCOMM, Inc.		
David Hind	QUALCOMM, Inc.		
Michal Koenig	QUALCOMM, Inc.		
Igor Virker	QUALCOMM, Inc.		
Paulo Breviglieri	QUALCOMM do Brasil		

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Mr. Bae	SK Telecom		
PSR Krishna	Tata Teleservices		
Steve Vodicka	Telstra		
Ted Mahan	US Cellular		
Lou LaMedica	Verizon Wireless		
Jerry Flynn	Verizon Wireless		
Tila Xavier	Vivo		
Matteus Barreto	Vivo Brasil		

<Table of Contact Information – name, title, email, phone number>

2.1.5 Time Line

Use this space to capture proposed time line of major Operator Group initiatives.

2.2 Certification Group

The Certification Group as envisioned would define the process by which a handset or test lab is certified. This group would be made up of representatives of certification bodies from each of the markets where CDMA is deployed. It is proposed that the certification process to be defined by this group be borne out of certification processes in effect within each participating organization. The CCF process specification would then be the highest practical common denominator of all these processes. The initial focus of the Certification Group would be to define, publish, and implement a set of process specifications including platform certification, handset certification, lab certification, subject matter expert certification, and a process to resolve certification disputes.

2.2.1 Charter

The proposed founding charter of the Certification Group is to define and maintain global core certification test processes based upon test specifications identified or defined by the Technical Group to ensure terminal conformance to feature and function requirements set forth by the Operator Group. These processes must allow for and support local market variations. The initial charter would also include the granting of the “certification seal” as well as defining and convening as necessary a board to resolve disputes over certification.

2.2.2 Roles & Responsibilities

Initial roles and responsibilities for the Certification Group should initially focus on ensuring all the technical, business, and legal processes are in place to support the certification process. By way of example these would include:

1. Publishing and maintaining certification process document.

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2. Establishing a database for tracking CCF certified products.
3. Identifying certifying bodies in each market (e.g. A2LA, CNAL) and establishing their requirements for certifying labs in their markets.
4. Orchestrating the certification of test labs.
5. Identifying and ensuring proper legal mechanisms in place (i.e. local regulatory requirements met, liability issues resolved).

2.2.3 Deliverables

Initial deliverables for the Certification Group include process specifications and procedures.

2.2.3.1 Process Specifications

Process specifications define how a product or service is certified by the Certification Group. Process specifications envisioned early on include handset certification, lab certification, and subject matter expert certification. A process specification for platforms would be targeted to facilitate self-certification.

2.2.3.1.1 Handset Certification

A Handset Certification specification would define the process by which a handset is certified by the CCF. Such a specification is envisioned to include entrance requirements, relevant standards, applicable test cases from those standards, TBD.

2.2.3.1.2 Lab Certification

A Lab Certification specification would define the process by which a test lab is certified by the CCF. Such a specification is envisioned to include requirements per ISO-17025, a definition of minimum competence requirements, and the methodology for developing or evaluating that competence. Auditing procedures would be an essential element of lab certification to ensure labs maintain their level of qualification as technologies and test coverage evolve, as well as ensuring consistent results across certified labs.

2.2.3.1.3 Subject Matter Expert Certification

A Subject Matter Expert certification would define the process by which the CCF comes to recognize an individual as qualified to represent the engineering interests of the CCF during lab certifications. Such a specification is envisioned to include exhaustive written and oral evaluations and perhaps a brief apprenticeship program.

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2.2.3.1.4 Platform Certification

A Platform Certification specification would define how test equipment vendors would go about certifying their specific hardware and software configurations and how to maintain that certification. The availability of such certified platforms will be essential in the eventual migration of at least part of the certification process into vendor controlled labs.

2.2.3.2 Procedures

The Certification Group will be responsible for establishing policy and procedures necessary to ensure objectivity and fairness to all participants in the certification program. Initial policies and procedures include dispute resolution, TBD.

2.2.3.2.1 Dispute Resolution

A fundamental operating principle of the CCF will be to establish and maintain a certification test methodology that ensures proper execution of test cases as well as uniformity of test results across all certified labs. However, it is expected that some discrepancies will occur between vendor test results and certification test results, or even certification test results between two labs. Therefore, the Certification Group would define procedures by which disputes between participating members can be resolved. Such a specification is envisioned to include TBD.

2.2.4 Participants

The Certification Group is proposed to be staffed by the relatively exclusive group of individuals that represent recognized certification programs from their various markets. Initial participation is anticipated to include RISC, CTIA, ICC, JATE, TRAI/TEC, and TTA. Table TBD lists the certification organizations who are currently active participants in the CDMA Certification Forum Certification Group.

<Table of Contact Information – name, title, email, phone number>

2.2.4.1 RICS

The Research Institute of Communications Standards (formerly RITT), under the China Academy of Telecommunication Research, MII in Beijing is the organization responsible for certifying handsets and granting a National Access License for handsets entering the China market.

2.2.4.1.1 Contact Information

TBD by group participant.

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2.2.4.2CTIA

The Cellular Telecommunications & Internet Association (CTIA) is the international organization that represents all elements of wireless communication - cellular, personal communication services enhanced specialized mobile radio, and mobile satellite services - serving the interests of service providers, manufacturers, and others. The CTIA Certification Program provides the wireless industry with an unbiased, independent and centralized product evaluation service. Since 1991, the Certification Program has tested consumer wireless products for conformance to established industry standards. Products passing CTIA's rigorous analysis are granted the right to display the CTIA Certification Seal. Web site: <http://www.wow-com.com> .

2.2.4.2.1 Contact Information

TBD by group participant.

Cellular Telecommunications & Internet Association (CTIA)
Certification Department
1400 16th Street, NW
Suite 600
Washington, DC 20036
e-mail: Certification@ctia.org
Telephone: 1.202.785.0081
Web: <http://www.wow-com.com/consumer/devices/certification/articles.cfm?ID=76>

2.2.4.3ICC

<brief overview of organization>

2.2.4.3.1 Contact Information

TBD by group participant.

2.2.4.4JATE

<brief overview of organization>

2.2.4.4.1 Contact Information

TBD by group participant.

2.2.4.5TRAI/TEC

<brief overview of organization>

2.2.4.5.1 Contact Information

TBD by group participant.

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2.2.4.6TTA

The purpose of TTA is to contribute to the advancement of technology and the promotion of information and telecommunications services and industry as well as the development of national economy, by effectively establishing and providing technical standards that reflect the latest domestic and international technological advances, needed for the planning, design and operation of global end-to-end telecommunications and related information services, in close collaboration with companies, organizations and groups concerned with information and telecommunications such as network operators, service providers, equipment manufacturers, academia, R&D institutes, etc.

<http://www.tta.or.kr/English/new/main/index.htm>

2.2.4.6.1 Contact Information

TBD by group participant.

2.2.5 Time Line

Use this space to capture proposed time line of major Certification Group initiatives.

2.3 Technical Group

The Technical Group as envisioned is the engineering arm of the CCF. While the Certification Group defines the *process* by which handsets and labs are certified, the Technical Group defines the *technical requirements* in the form of *test cases* that are executed during that process. The initial focus of the Technical Group would be to develop and release lab and field test specifications, draft contributions to international standards bodies (e.g. 3GPP2) to develop test cases required to support certification requirements, perform technical training of lab personnel to conduct testing, and physically certify test labs per processes and procedures defined by the Certification Group.

2.3.1 Charter

The proposed charter for the Technical Group is to ensure that the common test requirements defined by the Operator Group are captured in the appropriate international specifications, to train and qualify test facilities to conduct certification testing as defined by the CCF, and provide technical guidance to the CCF to readily enable adoption and implementation of evolving CDMA-based technologies.

2.3.2 Roles & Responsibilities

Initial roles and responsibilities for the Technical Group should include:

1. Publishing and maintaining Test Specification identifying lab and field testing cases. Maintenance to include extending coverage to future releases (e.g. Rel A).

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2. Define common test report format.
3. Educate/train test labs, vendors, and operators on how to conduct testing to this specification.
4. Work with test equipment vendors to increase test cases support to test plan, including automation.
5. Provide ongoing technical support to operators, vendors, and test labs conducting certification testing.

2.3.3 Deliverables

Near-term deliverables of the Technical Group include test specifications, 3GPP2 contributions, technical training of lab personnel, and certification of labs.

2.3.3.1 Test Specifications

Three test specifications are proposed to be developed and published at the earliest opportunity. The first is a Lab Test specification to define all test requirements that shall be conducted in a cabled environment on commercially available test equipment. The second is a Field Test specification to define all tests requirements that shall be conducted in an over-the-air environment on commercial networks. The third is Stability & Performance Test specification.

2.3.3.1.1 Lab Testing

Define the maximum set, supported by commercially available test equipment, of the compliance tests specified in C.S0011-B (TIA/EIA-98-E), C.S0036-0 (TIA-916) and C.S0033-0 (TIA-866), the maximum possible set of signaling conformance tests specified in C.S0031-0 (TIA-898), C.S0038-0 (TIA-919), and C.S0037-0 (IS-918), and selected tests from CDG 64. The objectives of these tests is to seek the absolute highest practical level of test coverage under automated, repeatable and fully controllable test conditions.

2.3.3.1.2 Field Testing

Define the infrastructure-dependent test cases extracted from C.S0031-0 (TIA-898), C.S0038-0 (TIA-919), C.S0037-0 (IS-918), C.S0036-0 (TIA-916), and selected tests from CDG 64. These tests are performed OTA against the Base Station from each manufacturer. The objective of these tests is to verify MS-BS compatibility where the Base Station is known to be standards-compliant, but where the Base Station vendor implementation of the Standard will govern operation of certain features.

2.3.3.1.3 Stability & Performance Testing

Define suite of tests to verify overall handset terminal robustness, stability and performance. The handset is tested against CDG 64, CDG 35 and against certain criteria extracted from industry experience.

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2.3.3.23GPP2 Contributions

As the Technical Group identifies test cases to support handset certification testing, these test cases will be captured and submitted in the form of contributions to the appropriate international standards group for incorporation into the appropriate standard. Initial certification testing that will be conducted against international standards include minimum performance, signaling conformance, interoperability, stability & performance, application execution environment, application enabler, and application testing.

2.3.3.3 Technical Training

It will be the responsibility of the Technical Group to conduct technical training as required to help participating organizations to meet the requirements of the CCF. Initial training envisioned includes CDMA2000 foundation training, handset lab and field test training, and training in the certification process.

2.3.3.3.1 CDMA2000 Foundation

Provide the student an in-depth description of the functioning of a CDMA2000 system according to the key CDMA standards and the rationale behind the specifications. (4 days)

2.3.3.3.2 Handset Lab Testing

Provide an overview of the CDMA2000 industry standard test processes followed by an in-depth practical discussion of how to conduct recommended minimum performance and signaling conformance testing of handsets on commercial test equipment in a laboratory environment. (2 days)

2.3.3.3.3 Handset Field Testing

Define and describe over-the-air interoperability test methods for verifying handset features and service options that are deployed on host CDMA systems. (1 day)

2.3.3.3.4 Certification Process

Provide an overview of the CCF certification process including a high level understanding of the test requirements, the organizations supporting the certification process, the logistics and administration involved in properly documenting the certification. (0.5 days)

2.3.3.4 Lab Certification

The CCF will look to the technical group to provide the subject matter expertise required for the lab certification process. This lab certification process is envisioned to include as a minimum evaluation of the competence in the lab in CDMA technologies and verification of test platform setup, calibration, and operation.

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2.3.3.4.1 Platform Verification

2.3.3.4.2 A2LA Processes

2.3.3.4.3 Competencies

2.3.4 Participants

Participants are envisioned to include engineer representatives from across the CDMA industry who have responsibilities in the handset test process including operators, infrastructure vendors, handset vendors, test equipment vendors, test labs, or any other organization participating in the CCF. Table TBD identifies individuals who have participated to date.

<Table of Contact Information – name, title, email, phone number>

2.3.5 Time Line

Time line specific to the Technical Group with key milestones.

2.4 Vendor Group

The Vendor Group as envisioned would include infrastructure vendors, handset vendors, test equipment vendors, and test houses. The Vendor group would work hand-in-hand with the Operator Group to establish the global handset specification. It would work with the Technical Group and Certification Group to help define test requirements and certification processes that are compatible with vendor feature deployments and associated time lines. Initial deliverables from this group could include test requirements, test solutions, and a test evolution process specification.

2.4.1 Charter

The proposed charter of the Vendor Group includes proposing value-added test cases employing state-of-the-art test mechanisms, promote the logical evolution of certification testing as test capability evolves, and working to develop automated commercial test platforms and processes to minimize time and cost of certifying terminals.

2.4.2 Roles & Responsibilities

The initial roles and responsibilities of the Vendor Group are envisioned to focus on TBD.

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2.4.3 Deliverables

It is proposed that early deliverables from the Vendor Group include a test requirements document, test solutions document, and a. test evolution process specification

2.4.3.1 Detailed Test Requirements

Vendors have some of the best insight into test solutions necessary to ensure handset compliance and handset/infrastructure compatibility. TBD

2.4.3.2 Test Solutions

TBD.

2.4.3.3 Test Evolution Process Specification

The Test Evolution Process Specification would define a process whereby test solutions are first implemented at the earliest opportunity by the most efficient methodologies available, but have a clear path leading to fully automated implementations on commercially available test equipment.

2.4.4 Participants

Participants are envisioned to include engineer representatives from across the CDMA industry who have responsibilities in the handset test process including. Table TBD identifies individuals who have participated to date.

<Table of Contact Information – name, title, email, phone number>

3 Legal Entity

3.1 Board of Directors

3.2 Officers

3.3 Bylaws

3.4 Venue

4 Financial Mechanisms

4.1 Fee Structure

Training fees to be borne by the benefiting party.

5 Master Time Line

5.1 Time Line

- ▶ Create CDMA Certification Forum Operator Group
- ▶ Create Certification, Technical, and Vendor groups
- ▶ Incorporate CCF Organization
- ▶ CCF Launch - June 2004
- ▶ Publish Test Plan – August 2004
- ▶ Publish Certification Plan – December 2004
- ▶ Certify Test Labs – December 2004 to February 2005