

The performance of CDMA networks is load-dependent. In a real network there is a high correlation between the RF load and the combined Signaling and User Data Loads and a highly dynamic trade-off between quality, coverage and capacity. To test and optimize the network, it must be loaded with a representative and deterministic load. The Dyaptive DMTS 3200 creates that load.

DMTS Applications

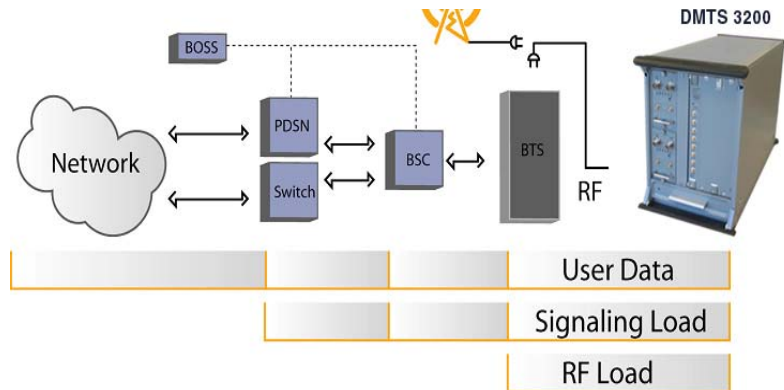
- Verification of New Features in Infrastructure
- Product & System Regression Testing
- Network Troubleshooting & Fault Diagnosis
- Performance Tuning & Optimization
- Data Service Rollout Planning
- Background Load & Handset Verification

DMTS Key Capabilities

- Deterministic, repeatable, realistic and easily defined call model
- Multi generation protocol testing
- Handoff scenarios
- Channel simulation
- Detailed logging & diagnostics
- Reconfigurable & programmable

DMTS Benefits

- Many-fold increase in test coverage
- Substantial improvement in test efficiency & automation
- Increased value from test activity
- Speed up deployment of new data services
- Reduce number of dropped calls; missed and blocked pages



Loading CDMA Networks

Today, wireless infrastructure vendors and carriers rely on a handful, or more likely a room full, of mobile phones to test their wireless products, but these “load boxes” cannot produce deterministic, repeatable call models.

Without the ability to simulate real-world load, including power management, registration, call set-up, user data and handoffs etc., it is impossible to determine how a base station, a network or a handset will react to different load profiles such as the introduction of new data services.

The DMTS 3200

Dyaptive’s DMTS 3200 is a unique, modular SDR, ‘Software Defined Radio’ solution that replaces “load boxes” built from commercial mobile phones, with VMT’s, ‘Virtual Mobile Terminals’.

Regardless of the number of ‘virtual’ mobiles, there is only a single RF connection per sector, thus eliminating the complex wiring problem faced when using actual handsets.

The DMTS 3200 provides unparalleled density and flexibility in loading CDMA networks in a deterministic and repeatable fashion.

Realistic Call Model Simulation

The DMTS 3200 allows the user to configure a mix of multiple terminal and traffic types, traffic content, call arrival models and call duration models. The user can also specify particular data loads i.e. run a web browser or simulate a Push-to-Talk application. New call models are set up in minutes without the need to change equipment or cabling.

Multi Generation Protocol Testing

The DMTS 3200 supports new features e.g. PREV 7, MEID etc. long before there are commercial handsets available. This allows the user to check interoperability of new and old handsets against different releases of infrastructure.

Each mobile may be configured to run independent applications or even different protocol revisions. This allows simulation of complex, heterogeneous environments with mixes of user equipment.

Handoff Scenarios

Each mobile can receive from and transmit to two sectors simultaneously. Each path can be independently scaled. Handoffs can be simulated between sectors.

Channel Simulation

Channel simulation allows for the introduction of independent impairment of the forward and reverse links for each mobile. Impairments are soft programmable for each mobile to model a number of different RF path and fading profiles.

Logging & Diagnostics

Detailed logging of events and transactions is available at every layer of the protocol, providing detailed diagnostics that cannot typically be obtained through a commercial handset's 'Mobile Diagnostic Monitor' interface.

Each mobile provides access to detailed information relating to high-level transactions such as registration or call origination, retransmissions of messages, through to low-level frame types, and power control.

Automatic detection tools can pinpoint network configuration and protocol conformance issues instantly and avoid costly time spent manually searching through logs.

Configurability & Programmability

The DMTS 3200 is available with 50 or 100 mobiles and can be configured with 1 or 2 sectors, each sector with up to 11 carriers.

An advanced scripting mechanism provides the operator with the ability to recreate base-station or network failures and determine their exact cause. The level of control includes initiating transactions, injection of failures into any layer, forcing retransmissions, timeouts or overriding the power control on the reverse and forward links.

The DMTS 3200 increases your testing coverage and efficiency by an order of magnitude.

User Controls for Call Models and Simulation:

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| <p>System Configuration</p> <ul style="list-style-type: none"> • Frequency <ul style="list-style-type: none"> - Carriers • Logging errors <ul style="list-style-type: none"> - OTA signaling - Repeated messages - Filters • VMT Identities & Grouping <ul style="list-style-type: none"> - Statistical populations - Coordinated behavior - Random behavior • Test conditions & Triggers <ul style="list-style-type: none"> - Pass - Fail - Errors |
| <p>Traffic Model</p> <ul style="list-style-type: none"> • Terminal mix <ul style="list-style-type: none"> - 2G - 2.5G - 3G • Traffic mix <ul style="list-style-type: none"> - Voice - Data - SMS - Other traffic mixes • Traffic (data) rates • Statistics (per mobile, group, sector and system) <ul style="list-style-type: none"> - Registration rates - Call rates - Hold times - Voice activity factors, etc. |
| <p>Radio Environment</p> <ul style="list-style-type: none"> • Statistics (per mobile, group, sector and system) <ul style="list-style-type: none"> - Soft/ softer handoff - Hard handoffs - Access Handoff - Errors - AWGN - Inter-cell interference - Inter-mobile interference, etc • Fading • Multipath • Error injection |

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| <p>Air Interfaces/ Protocols</p> <ul style="list-style-type: none"> • IS-95A • TSB-74 • J-STD-008 • IS-95B (RS1, RS2, Voice, circuit switched data) • 1x-RTT Release 0, Release A, <ul style="list-style-type: none"> - RC1, RC2, RC3, RC4, RC5 - Voice, circuit/packet switched data |
| <p>Simulation Control</p> <ul style="list-style-type: none"> • Test definition language; Scripted test definition file execution • Creation of virtual radio propagation environment, virtual pilot strength, path loss, interference • AWGN and fading simulation • Control of VMT mobility • Softer/soft/hard handoff • Control per VMT, per VMT group • Call rate more than 60,000 BHCA |
| <p>Statistics Collection</p> <ul style="list-style-type: none"> • Real time call and data transfer statistics • Statistics can be viewed and analyzed per mobile, per group, per sector or per system |
| <p>Management</p> <ul style="list-style-type: none"> • Quick set-up and installation • Secure command line interface |
| <p>RF</p> <ul style="list-style-type: none"> • 800MHz Cellular, Japan • 1900 MHz PCS • 2 GHz, CDMA (Japan) • RF Bandwidth 15 MHz |

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