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Intellectual Property Package

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Intellectual Property Portfolio

▶ **Rapid mobility network emulator method and system / MobileCAD**

  ▶ US Patent **7,231,330**

  ▶ Licensed by a major technology leader in the industry (Requires NDA to disclose)

  ▶ 4G Emulation device under construction (Requires NDA for disclose)

▶ **System, apparatus, and methods for proactive allocation of wireless communication resources Predictive mobility / MobileIPP:**

  ▶ US Patents: **7,697,508** and **8,213,417**

  ▶ Licensed by a major technology leader in the industry (Requires NDA to disclose)

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Merging web, mobile, and cable

The 1ˢᵗ Asset: Wireless Emulation '330

FIG. 1

- Emulation of software and infrastructure in 3G/4G Systems and any packet-based communications network

- Drive Test performance characterization

- Validation of Media streaming

- Validation of Inter-RAT Handovers and UE Performance

- Testing mobile phone firmware

- Playback of Drive Test Logs to Mobile Terminals

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FIG. 1
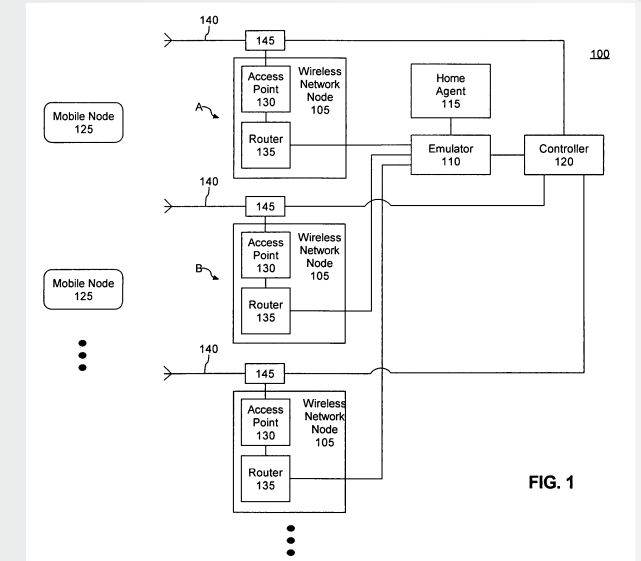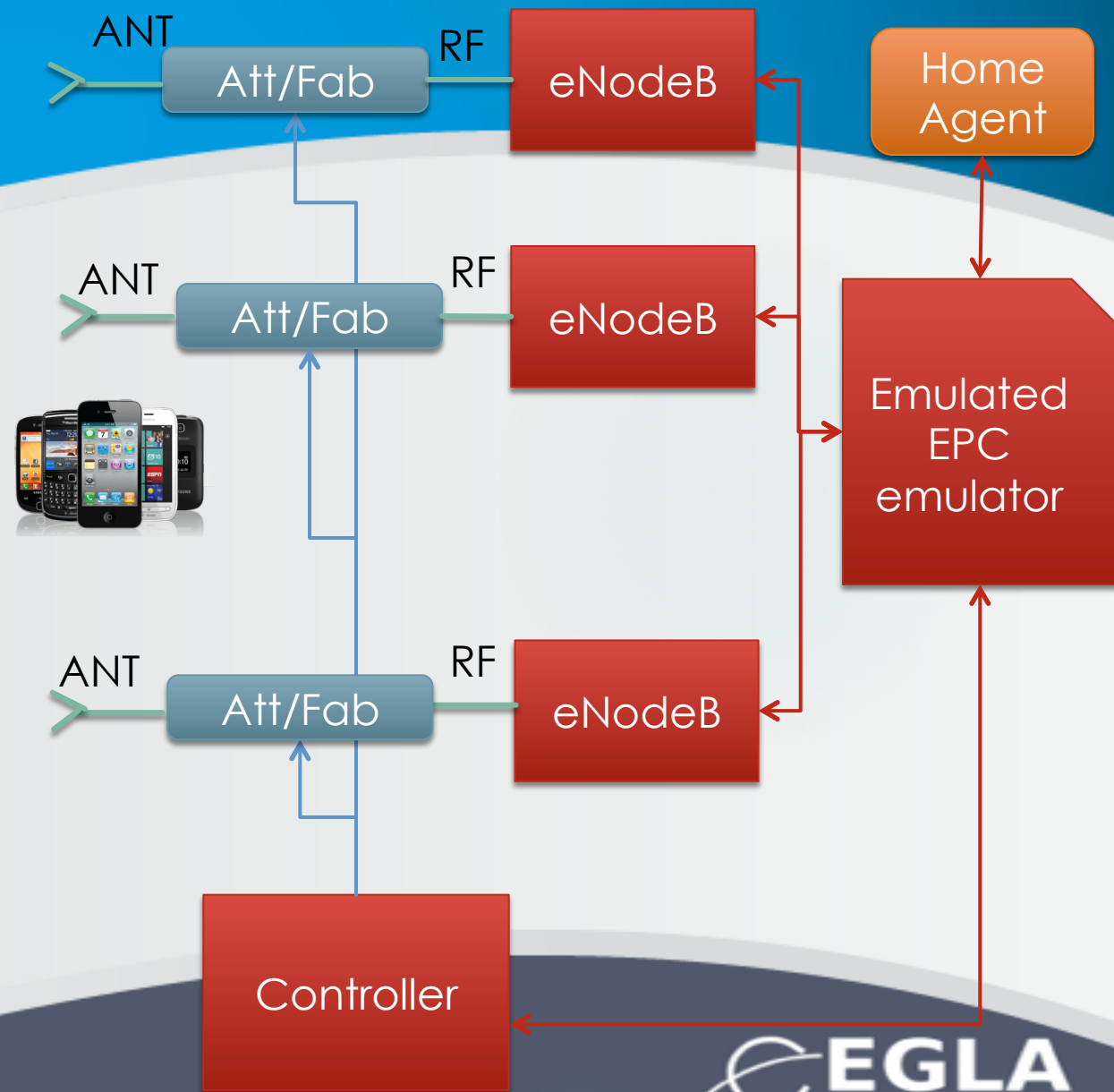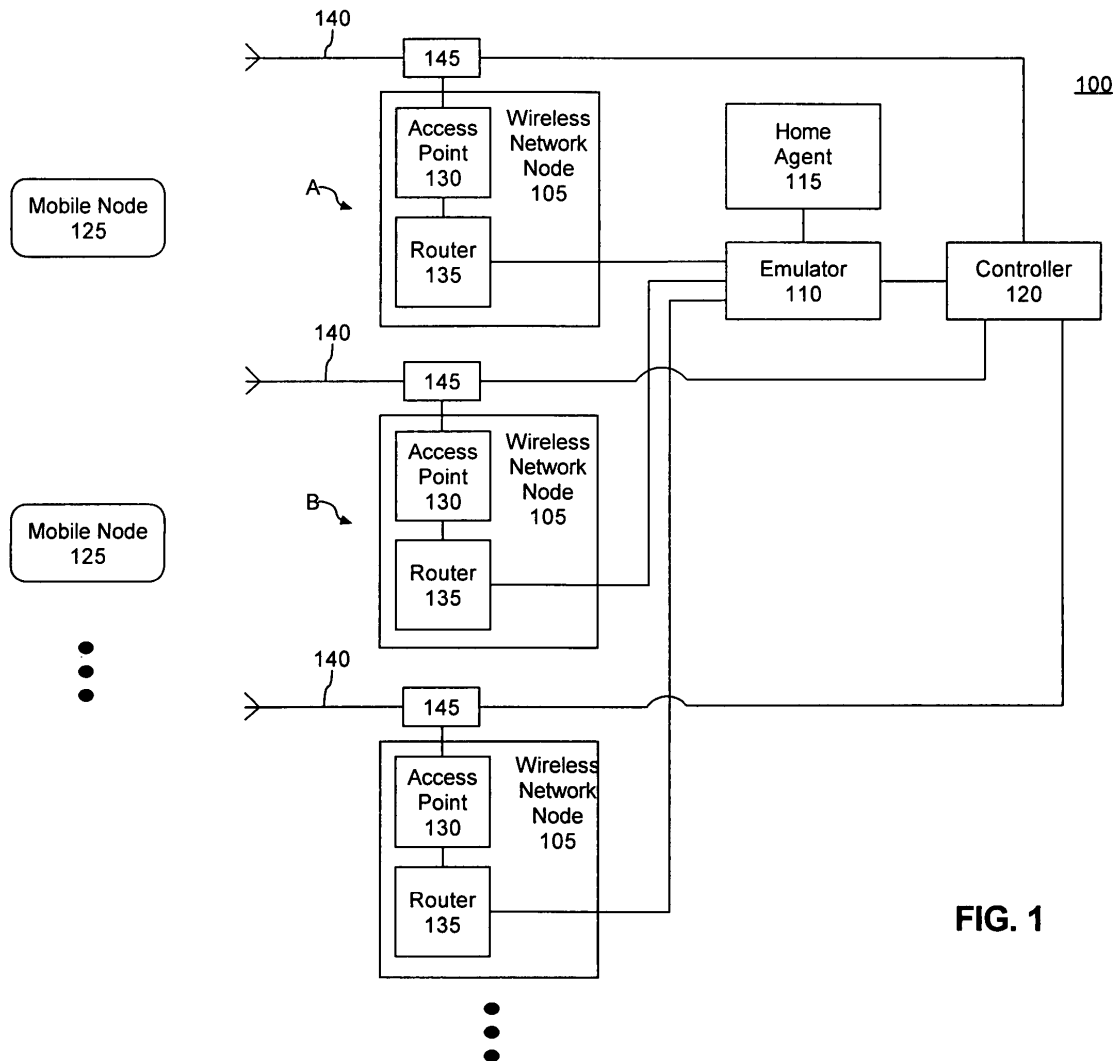
Usage of '330

▶ Network emulation in a packet-based communication wired and wireless network (UMTS, LTE)

▶ Playback of Drive Test Logs modifying signal strength

▶ Logging of information at Mobile Terminal Level

▶ Certification and conformance testing of Mobile Terminal Firmware

Wireless Emulation in 3G/4G Systems

VDT-CT Integration for End-to-End Performance Testing in the Lab

The VDT-CT is a key component in Spirent's end-to-end solution for user experience performance testing in the lab environment. The VDT-CT maps the RF data captured from the live network to Spirent's VR5 Spatial Channel Emulator, which then emulates the RF environment in the lab. The VR5 can connect directly to your lab-based network infrastructure, or to Spirent's CS8 Mobile Device Tester, to emulate the wireless network. Spirent's service experience measurement systems can be integrated to provide voice/video quality, call performance, data speed, battery consumption, and multi-service performance metrics enabling correlation between field and lab tests and accurate evaluation of the user experience.

Wireless technology has always been complex. That complexity is constantly growing, and every several years a wave of technical innovations hits and the complexity leaps exponentially forward. Today, major innovations in the device, Radio Access Network (RAN), core network and service layer are all hitting at once, driving wireless technology to unprecedented levels of complexity.

Apps / Services

VoLTE, HD Voice / Wideband Codecs, Video Chat, OTT / Cloud Services

| Device | Channel | RAN | Core |

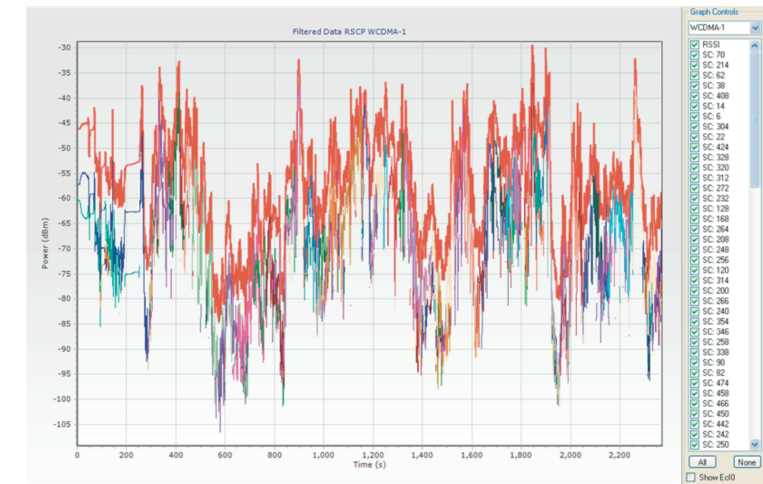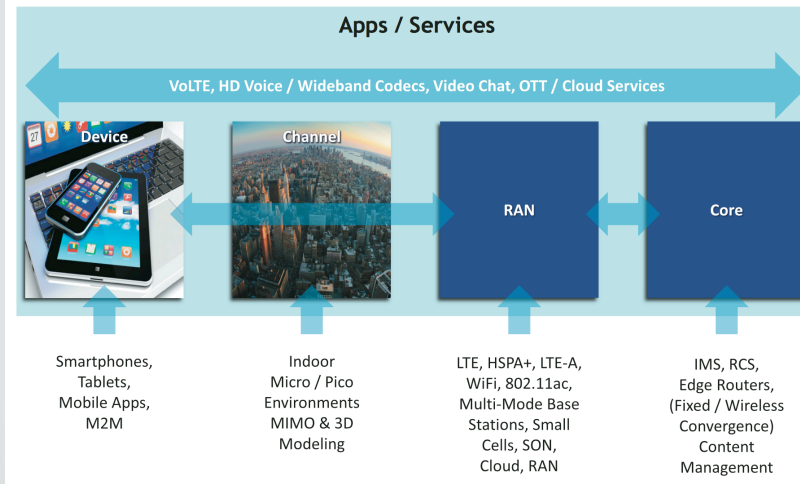| Smartphones, Tablets, Mobile Apps, M2M | Indoor Micro / Pico Environments MIMO & 3D Modeling | LTE, HSPA+, LTE-A, WiFi, 802.11ac, Multi-Mode Base Stations, Small Cells, SON, Cloud, RAN | IMS, RCS, Edge Routers, (Fixed / Wireless Convergence) Content Management |

Figure 3: An example of the dynamic, complex nature of the wireless channel: more than 76 base stations were observed during a 35 minute drive test of a live UMTS network.

RSSI Drive Test: -120dBm To -60dBm

- ▶ Covers a system with the EPC (Core Network) and faders
- ▶ Changes to AWGN, RSSI, BER, others
- ▶ Playback from a storage medium (File)
- ▶ Automated Testing (Controller)

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2ⁿᵈ Asset: Location Assisted Mobility

▶ Predictive Mobile IP/Proxy Mobile IP

▶ Mobility triggered by location prediction and tracking

▶ Proactive Allocation of Resources

▶ Testing mobile phone firmware and test new updates
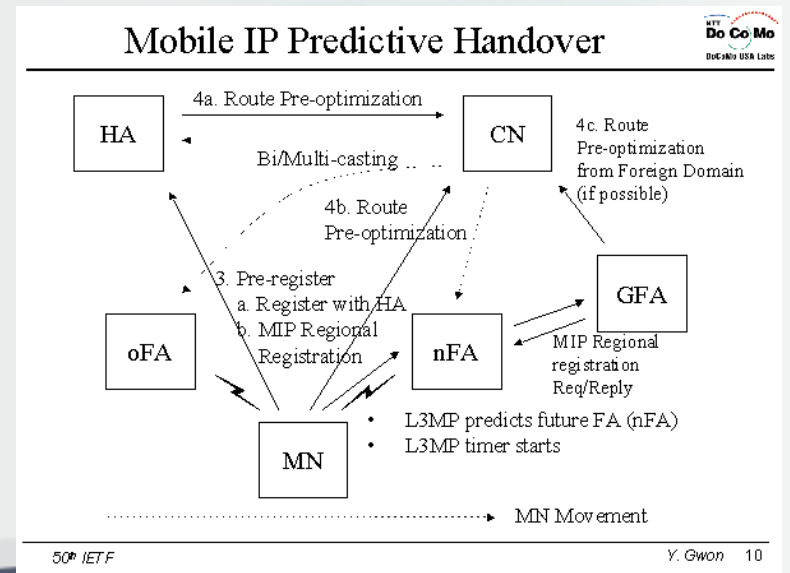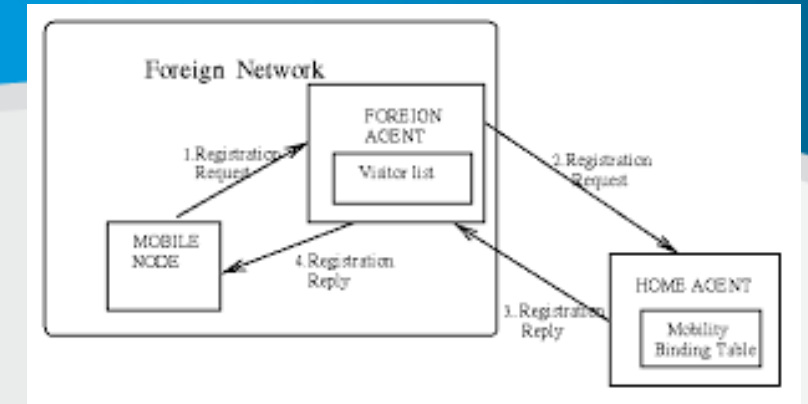
Handover LTE vs '508 Patent

FIG. 2B
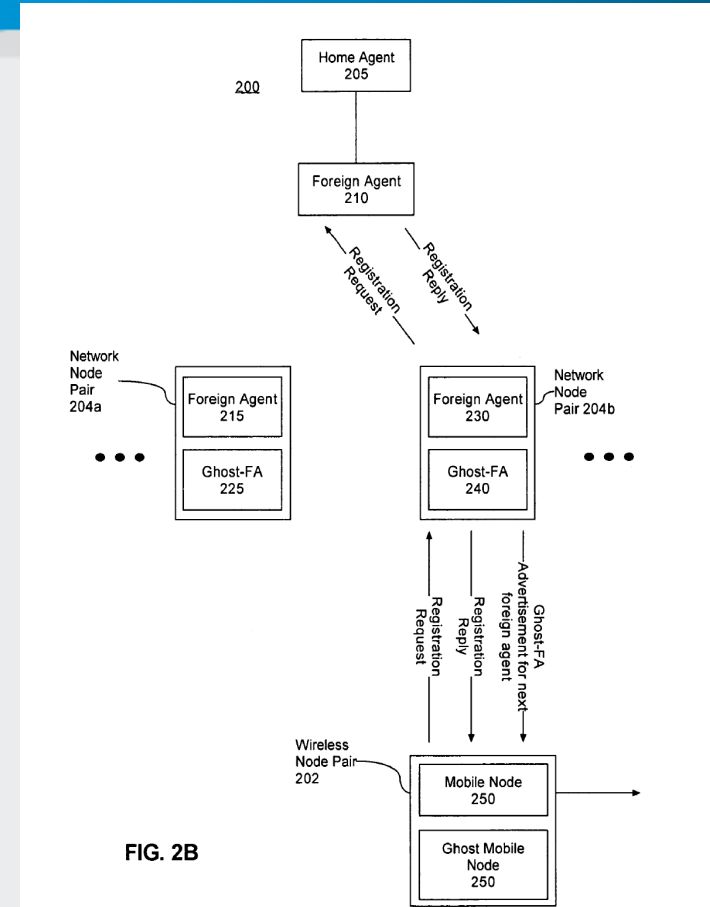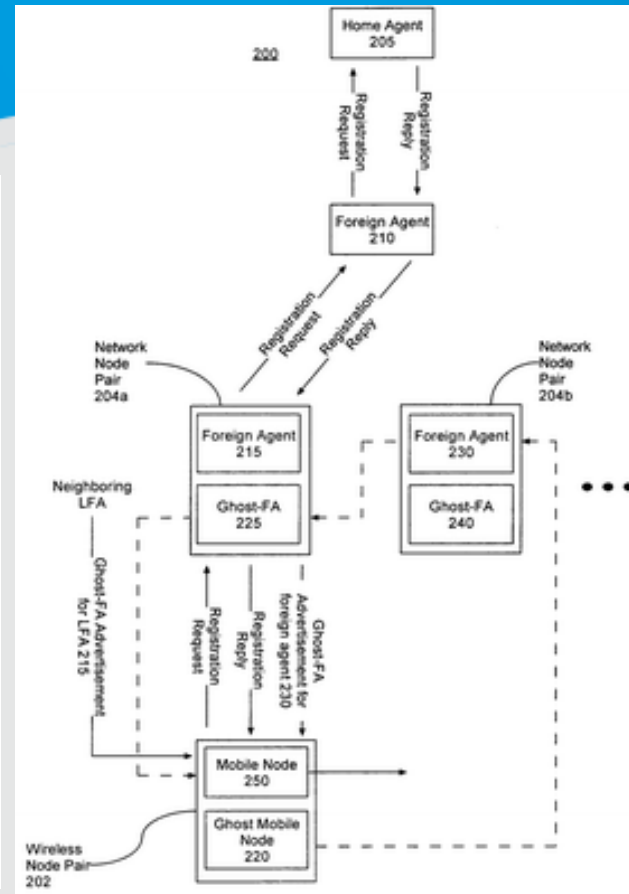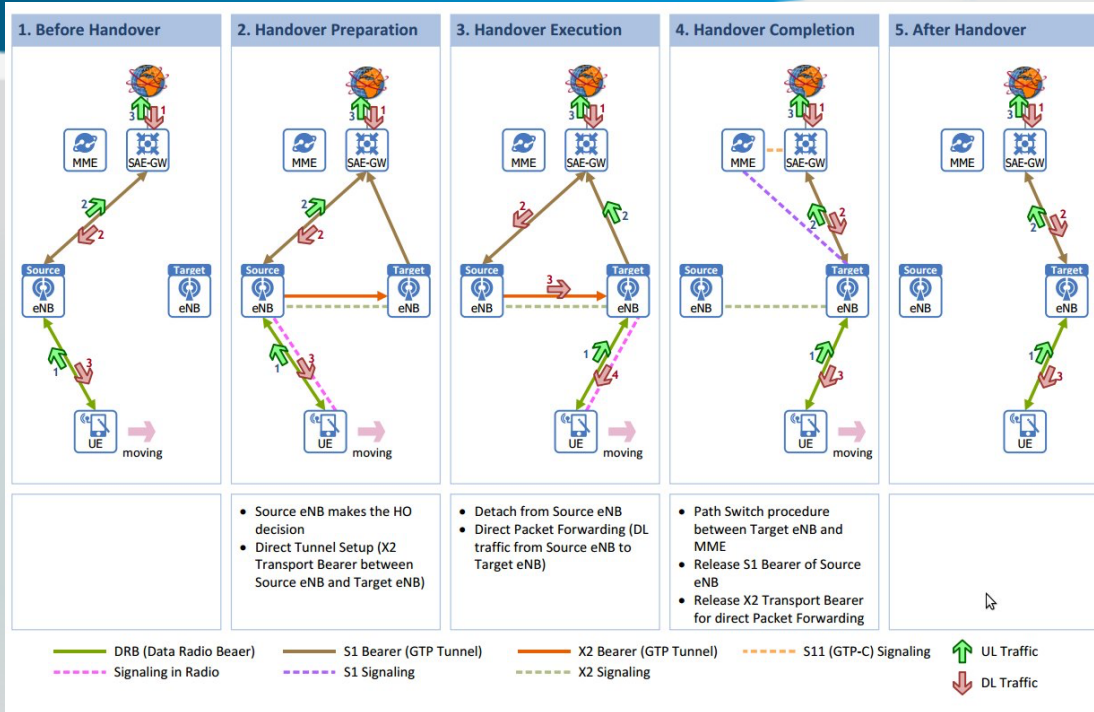
Prior Litigation/Patent Infringement

▶ **University of Florida Research Foundation vs Motorola Inc, case 0:2013cv61120, Southern District of Florida (Case Settled)**

Current Status

▶ A Drive Test Simulator implementing US Patent 7231330 is ongoing for 2G/3G/4G/LTE

▶ Prepared updated specifications and documentation for MobileCAD will be available to customer

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Inventors

Dr. Edwin Hernandez

BS, MS ECE, PhD in Computer Engineering.

Owner/CEO/Founder, 20 yrs Software/Tech Experience, Entrepreneur, 10 US Patents, **Patents Licensed by Top Tech companies**, Architect and visionary of Mediamplify

Dr. Sumi Helal

BS EE, MS ECE, PhD in Comp Sci, Purdue University.

IEEE Fellow, Professor University of Florida, Editor in chief of many journals and publications, inventor, Harris Mobile Computing Lab

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Licensing Inquiries or Partnerships

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