Espre’

Multi-level Communications Network System Design and Analysis Platform

Applications and Markets

Document Version: 3.0
June 29, 2009

Product Overview

Espre'® is an advanced network and communications design, prototyping, and simulation platform for communications components, systems, and network design being developed internally by TCI. The Espre' package provides the capability to create, model, simulate, and instantiate a wide variety of existing and new communication systems and networks using an advanced, fully featured and robust tool environment with a rich, easy to use interface. Unlike traditional communications and network system design software, Espre' is a complete, fully integrated tool environment that combines the key elements and numerous layers of the communications system, from antenna and signal capture through filtering, baseband processing, codec, packetization, transport, aggregation and backhaul for a wide variety of terrestrial, wireless and space-based communications environments and delivery systems. The Espre' platform allows users including hardware and software engineers to analyze and understand the impact of design choices on the overall communication system as well as validate their designs via FPGA platforms.

Market and Customers

The Espre' software will be able to service a broad customer base along with a plethora of vertical applications due to: a) its modular, customizable architecture; b) the platform easily leverages existing, well established tools including OPNET and MATLAB; and c) the software offers tremendous economies of scale with flexible pricing models. These verticals may be broken down in three general categories: **academia**, **government**, and **commercial**.

The **academic** marketplace is ripe for creating Espre' product traction and brand recognition. By introducing Espre' into the thousands of technical universities, colleges and preparatory schools around the globe, engineering students and educators alike will have the opportunity to use the software and add it to their portfolio and engineering 'toolbelt'. With colleges increasingly focused on communications and networking research and education, including cognitive radio research, the Espre' product cab become a key asset for this work.

The **government** market will be a key opportunity for the Espre' product, especially in the first several years. Espre' is designed to address the need of federal, state, and local agencies in support two initiatives in the American Recovery and Reinvestment Act. One, Espre' offers a wide array of functionality to help determine the networked requirements and performance assessment for the Smart Grid for the future Power Distribution System. Second, Espre' is, particularly well-suited to assess, verify, and design broadband networks in rural areas using the latest wireless technologies available today and in the near future. More specifically, the Espre' package will offer important cognitive radio and dynamic spectrum access capabilities. These functions are essential for addressing government-funded research and development in smart weapons, software-defined communications, data-linking munitions, and other networked weapons capabilities while driving down cost, improving reliability, and reducing power consumption. Target customers in this segment include NASA, the FCC, the National Science Foundation, the DoD, and the contractors and consultants working with these agencies and organizations.

Commercial industry represents a significant and long term market for Espre'. There are numerous segments within this category that are targets for the product. First on this list are the wireless semiconductor companies such as Freescale, TI, Qualcomm, ST-Ericsson, Broadcom, Atheros, and Marvel. These companies buy hundreds of millions of dollars of communication design tools every year in order to quickly simulate and prototype new radio and module designs from antenna to baseband to packet processor and switching engines. Next on the list are the large system integrators including IBM Global Services, Perot, Hewlett Packard/EDS, and Wipro, all of whom can use Espre' for such purposes as mesh networking analysis, signal integrity, tower and antenna placement, interference analysis and more. Wireless carriers and network operators like AT+T can also use Espre' for similar tasks as they build, upgrade, and redeploy commercial wireless technology and infrastructure. Another market opportunity for Espre' includes large enterprises and multinational companies as they grow and refit their own wireless facilities for new features including meshes, femtocells, 4G and even video cable replacement. Each of these various segments represents a long term, renewable customer revenue foundation.

Value and Differentiation

Espre' brings novel and distinct capabilities to communications network system design and analysis compared to competitive offerings. Key attributes which provide of the core platform include:

- Broad, multi layer features allow customers to develop from the PHY to the mesh and everything in-between
- Builds on other well adopted standard design tools and software including OPNET and MATLAB
- Re-usable portfolio and library of rich communications functions
- Modular, expandable and customizable
- System output includes FPGA target for full verification process
- Offers a variety of functional price points from student editions to Fortune 100 companies