

Terra Harvest: An open, integrated battlefield unattended ground sensors architecture



Robert Heathcock

Division Chief and Program Manager
Systems Integration and Test
Defense Intelligence Agency

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What we are doing right now

Developing an open UGS architecture

Building reference implementations with 7 vendors

Focusing on plug-and-play interfaces



What the guys in the field saw, and what they asked for

Too much incompatible equipment being sent to the field



Mix-and-match sensor components

Overwhelmed vendors who can't deliver to spec



Specifications that all vendors can build to

Equipment that can't be adapted in real time



Interoperable components and compatible interfaces



Our response in words...

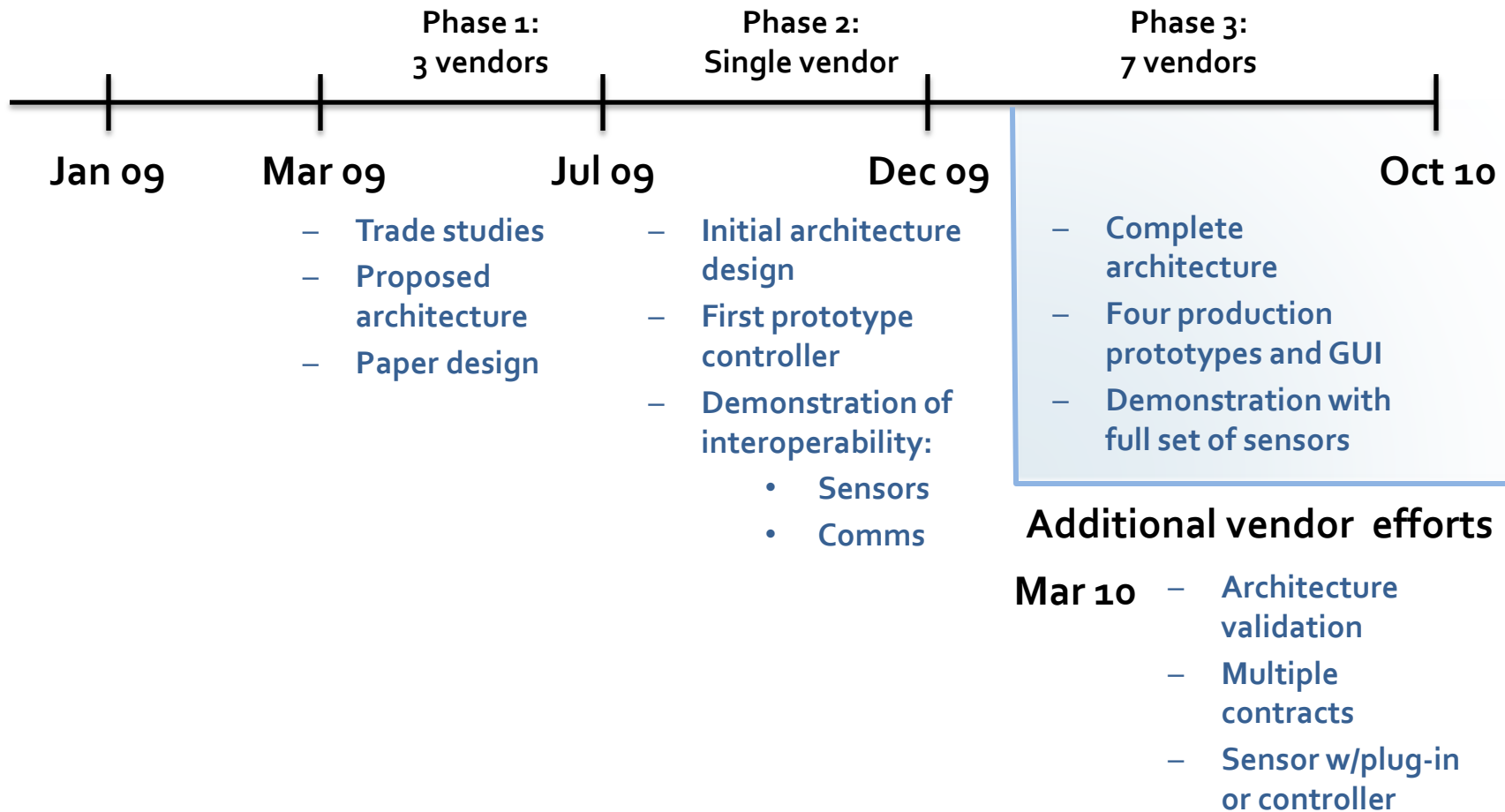
Terra Harvest Reference Architecture enables:

- Adding and replacing UGS capabilities seamlessly, with **minimal integration costs**
- Understanding the **interoperability** requirements of different application domains
- Passing **data and commands among UGS systems** built by different vendors
- Integrating different **data models and formats**
- Identifying and recommending **standards** for UGS communications



...and in deeds

Phases 1-3 controller RFP





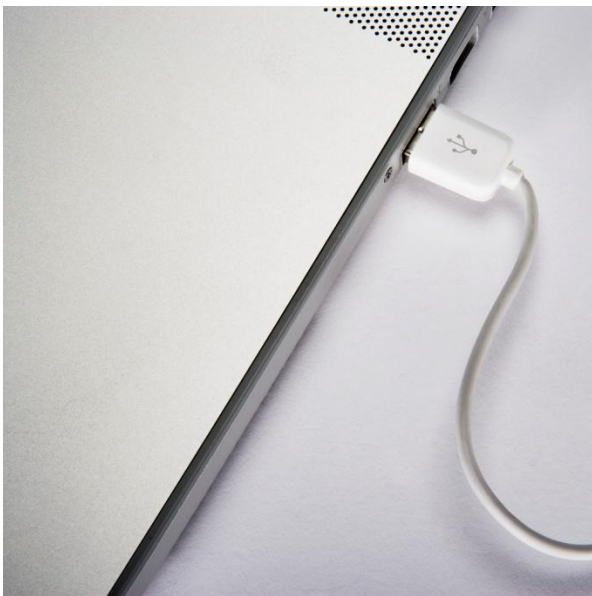
Terra Harvest working models as reference implementations

The **working models** derived from the architecture:

- Provide **technical specifications and test suite**
- Enable **independent verification and validation**
- **Clarify intent** of specifications if conformance tests fail
- Serve as **standard for measuring** other implementations



Plug-and-play interfaces



Terra Harvest aims to use standardized plug-in interfaces to make interoperability possible

Plug-in technology refers to the logical connections of hardware with software



Architecture framework

OSGi: Allows a given device to change the composition of networks in real time, without requiring a restart

Data fusion techniques: Correlate dissimilar data and save time and money

SensorML: Helps UGS controller accept and interpret data from disparate sensors, and interoperate between them



U.S. Army file photo.
http://www.usaasc.info/alt_online/article.cfm?iID=0801&aid=09



Communications components



http://commons.wikimedia.org/wiki/File:Land_Warrior_2001.JPEG

Common Sensor Radio: Remote systems operate autonomously to provide continuous unattended surveillance of battlespace

Broadband Global Area Network (BGAN): Offers data exfil option

Iridium: Offers data exfil option, though not as robust as those for the BGAN