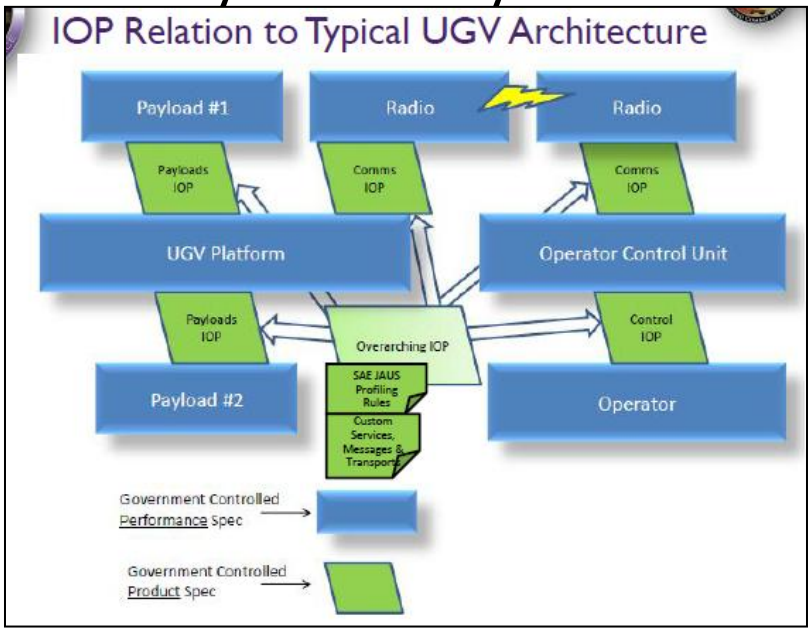
Profile (IOP) & OSD Interoperability IPT

Marvin E. Iavecchia
Senior Staff Advisor, Washington DC
marvin.iavecchia@us.army.mil

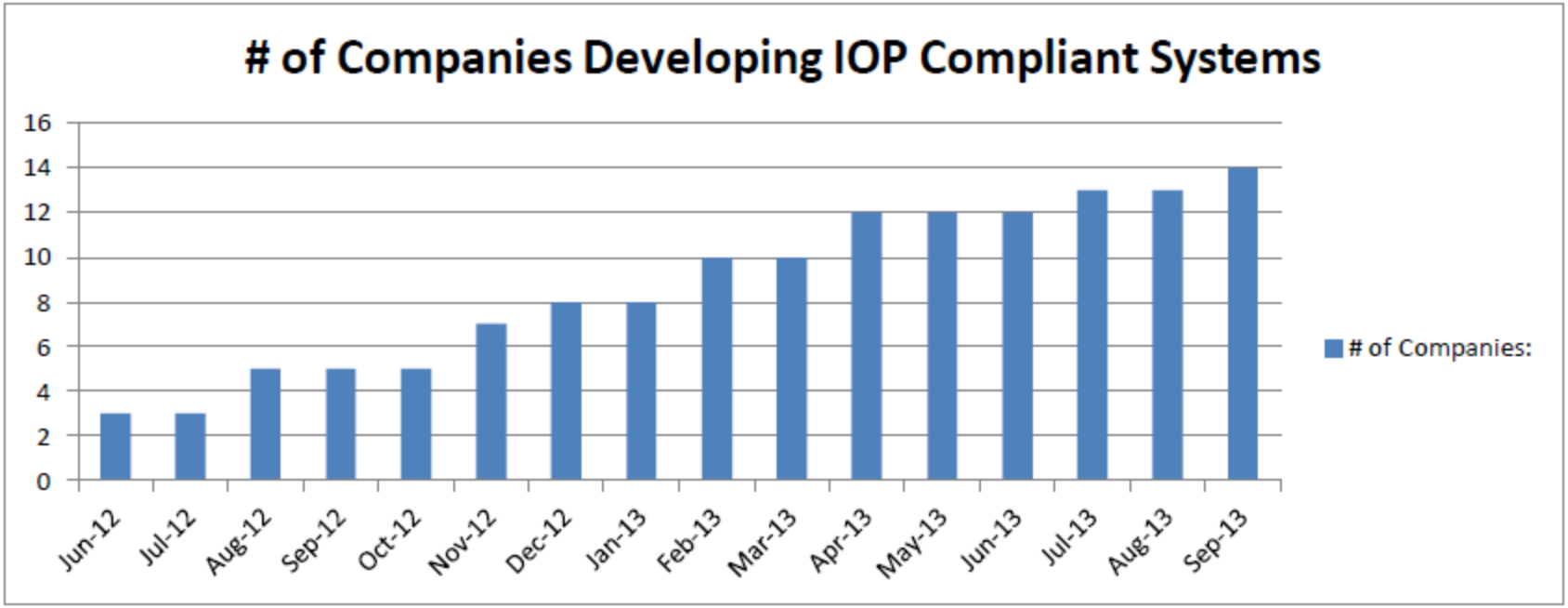
UGV Interoperability Profile (IOP)

- Defines H/W & S/W interfaces between UGV platforms, payloads, radios & controllers
- Developed through collaborative voluntary Working IPT (WIPT)
- Interfaces will be mandated in all future RS JPO UGV (Army, USMC, future USAF) RFPs
- Enables full consistency with Navy AEODRS modular family of systems



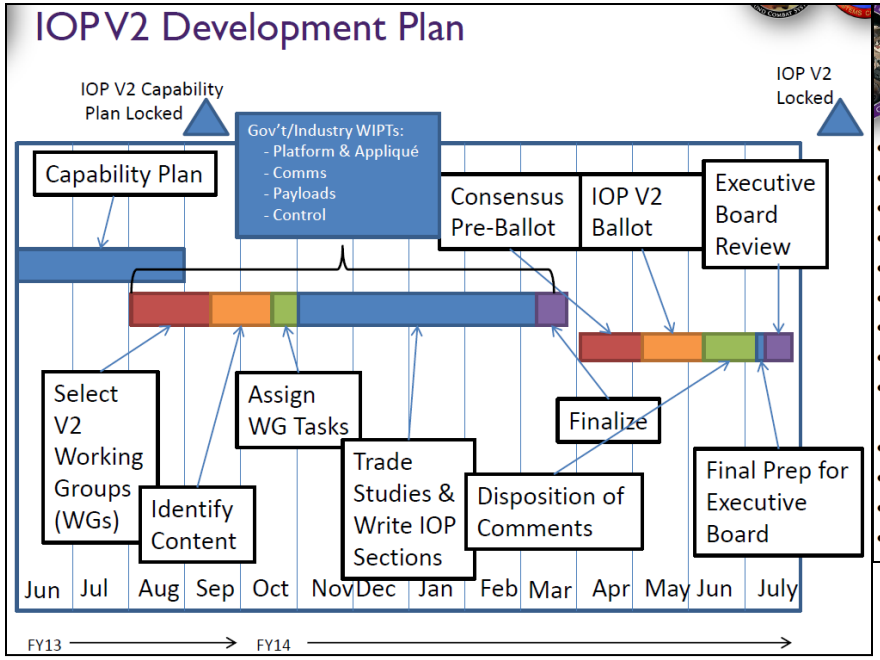
UGV Interoperability Profile (IOP)

- IOP Version 0 published December 2011
- IOP Version 1 published August 2013



IOP V2 Development

- IOP V2 will expand scope to focus primarily on safety-critical appliqué systems



IOPV2 Capability Plan – New Capabilities & Interfaces

- Maintenance Data Port
- Vehicle Network & Time Management
- On-Platform Data-Routing
- Weapon Engagement & Control*
- Payload Render-Useless
- Radar Sensors
- Hydraulic & Air Actuators
- Basic Waveform Requirements
- Off-Board Network / External Comms Interfacing*
- New Logical Interface Management
- Complex Arm/Actuator
- Door Lock/Unlock
- Self-Collision Avoidance
- Actions On Waypoints
- Drive-Path/Trajectory
- Basic Platform Health/Maintenance-Info
- Reset/Reboot
- Software Reporting
- Platform/Payload Modeling
- Platform/Payload Specifications Description
- Platform Stability
- Explosives Detection
- IA & Security Guidance

UGV Interoperability – Future Planning

Near Term (0-5 yrs)

Standardized interfaces must be enforced between UGV platforms, payloads, controllers, and wireless communication devices. This will enable interoperability and modularity within systems and will lay the foundation for an affordable and sustainable lifecycle management model.

Mid Term (5-10 yrs)

UGVs must begin interfacing with authorized external systems and domains, such as other unmanned systems, manned ground vehicles, remote video terminals, and mobile/hand-held devices. This will enable a variety of new capabilities for Warfighters in different domains, as well as for UGVs themselves. This activity will be coordinated through the Army Common Operating Environment and other joint activities. Additionally, joint and multinational interoperability with key allies must be established through the use of shared interface requirements.

Far Term (10-20 yrs)

The ability to interface with UGVs will be widely achievable by authorized external systems. Higher level interoperable message types will facilitate increases in system autonomy and distributed computing will be enabled via interoperable offloading of computing-intensive functions to appropriate systems. UGVs will be capable of sharing a variety of collected and processed information to a variety of consumers, which will enable enhanced situational awareness and decision making capability in both manned and unmanned consumers.

Challenges

- Communication of what IOP is/does
- Collaboration: difficult to keep up with so many different organizations
  - Different industries (robotics, automotive, S/W, networks, etc.)
  - Different domains (ground, air, manned systems, network/COE, etc.)
  - Joint services
  - Multi-national
  - Inter-Agency
- Technical solutions often compete w/ economic forces
  - Is robotics industry (partially) converging w/ automotive industry, for example? What about mobile computing industry?

Get Involved / Questions:
mark.mazzara@us.army.mil

OSD AT&L UAS Task Force and Interoperability-IPT

- UAS Task Force charter approved by Under-SECDEF AT&L and Deputy SECDEF September 11, 2010
- Several IPTs and focus areas to include:
  - Airspace and Integration IPT
  - Interoperability IPT
  - Frequency and Bandwidth IPT
  - Logistics and Sustainment IPT
  - DoD Unmanned Systems (UxS) Roadmap
  - Unmanned Interoperability Initiative Capability Based Assessment (CBA)
- Important Web Links
  - www.acq.osd.mil/sts/organization/uw.shtml
  - https://interoperabilityipt.org
  - https://ucsarchitecture.org