



Product Lines for Satellite Ground Systems

**Issues Identified at the
Product Lines for Command and
Control Ground Systems Workshop at SPLC1**

Presented by

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Outline

- **Background**
- **Results**
- **Issues**
- **Next Steps**

Background

- **The Software Engineering Institute held the First Software Product Lines Conference (SPLC1) August 28-31, 2000, Denver, CO**
- **Full day workshop focused on product lines for command and control ground systems**
- **Goals were to:**
 - **Identify issues that are:**
 - **C2 ground system (domain) specific vs. common across multiple domains**
 - **product line specific vs. common to all products**
 - **Identify recommended actions:**
 - **for the PL community**
 - **for the command-and-control ground system communities**
 - **for academic and industrial researchers**

Participants (1)

Organizers

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Results of the Workshop

- **We identified high importance issues in two categories**
 - technical
 - other
- **Most of the issues we identified arise in many domains**
 - **But we identified the need for C2 specific solutions**

SGS PL Issues - Other

Problem	SGS Specific?	PL Specific
1) How do you manage change of an organization to effectively use product lines? <ul style="list-style-type: none">• rewards• training• people• processes• funding• infrastructure• technology base	N	Y

SGS PL Issues - Other

Problem	SGS Specific?	PL Specific
2) How do you make a business case for a product line? <ul style="list-style-type: none">– cost savings– shorter schedule– lower risk	N	Y

SGS PL Issues - Other

Problem	SGS Specific?	PL Specific
<p>3) How is a partnership reached to make PL successful for both customer/acquirer and developer/contractor?</p> <ul style="list-style-type: none">– should the Government incentivize product lines?– should the market forces determine if product lines are appropriate?	<p>Question is not, but a domain-specific solution is needed</p>	<p>Y</p>

SGS PL Issues - Technical

Problem	SGS Specific?	PL Specific
4) Is it possible (and if so, when is it appropriate) to define a reference architecture? <ul style="list-style-type: none">– Industry-wide?– For the Command & Control domain?	Question is not, but a domain-specific solution is needed	Y
5) How do we evolve existing architectures into a product line architecture?	N	Y

SGS PL Issues - Technical

Problem	SGS Specific?	PL Specific
<p>6) We need to identify and apply tools & methodologies to adequately define architectural components and interactions</p> <ul style="list-style-type: none">– including common semantic properties– that will allow definition of standard interfaces– with reference implementations– of fine granularity– specific to C2 product lines	<p>Question is probably not, but a domain specific solution is needed</p>	<p>Y</p>

Next steps

- **Work to find solutions to these issues**
 - Can these be solved? How?
- **Are community efforts solving the problems?**
 - Space Object Technology Group
 - Other?
- **Are product lines really being used in satellite ground programs?**
 - Are they working?