Live, Virtual, Constructive Architecture Roadmap: The Quest for Interoperability, Standards, and Reuse

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Presentation Agenda

- Introduction
- Where are we?
- How did we get here?
- Where are we going?
- How are we getting there?
- Why are we doing this?
- Conclusion

Where are we?

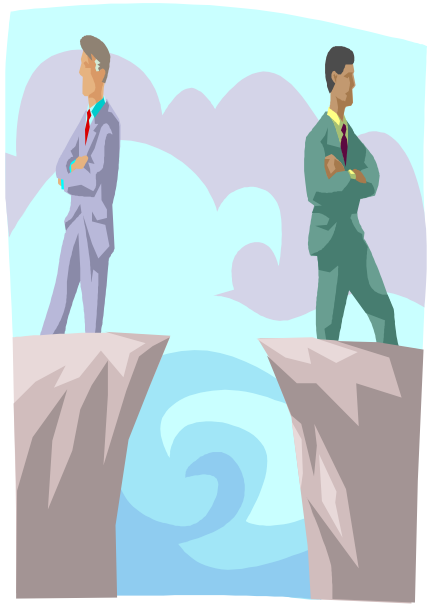
- LVCAR Study Completed SEP 2008
- Provided:
  - Recommendations
  - Rationale
  - Business Models
- Phase II:
  - LVCAR Implementation
  - Two year effort
  - Take advantage quick starts
  - Involve the entire M&S community
  - Provide exit strategy

How did we get here?

Growing Demand For
LVC Interoperability
Technical & Joint Operations

Broad Proliferation of
Tools, Standards, Gateways
Repositories, etc

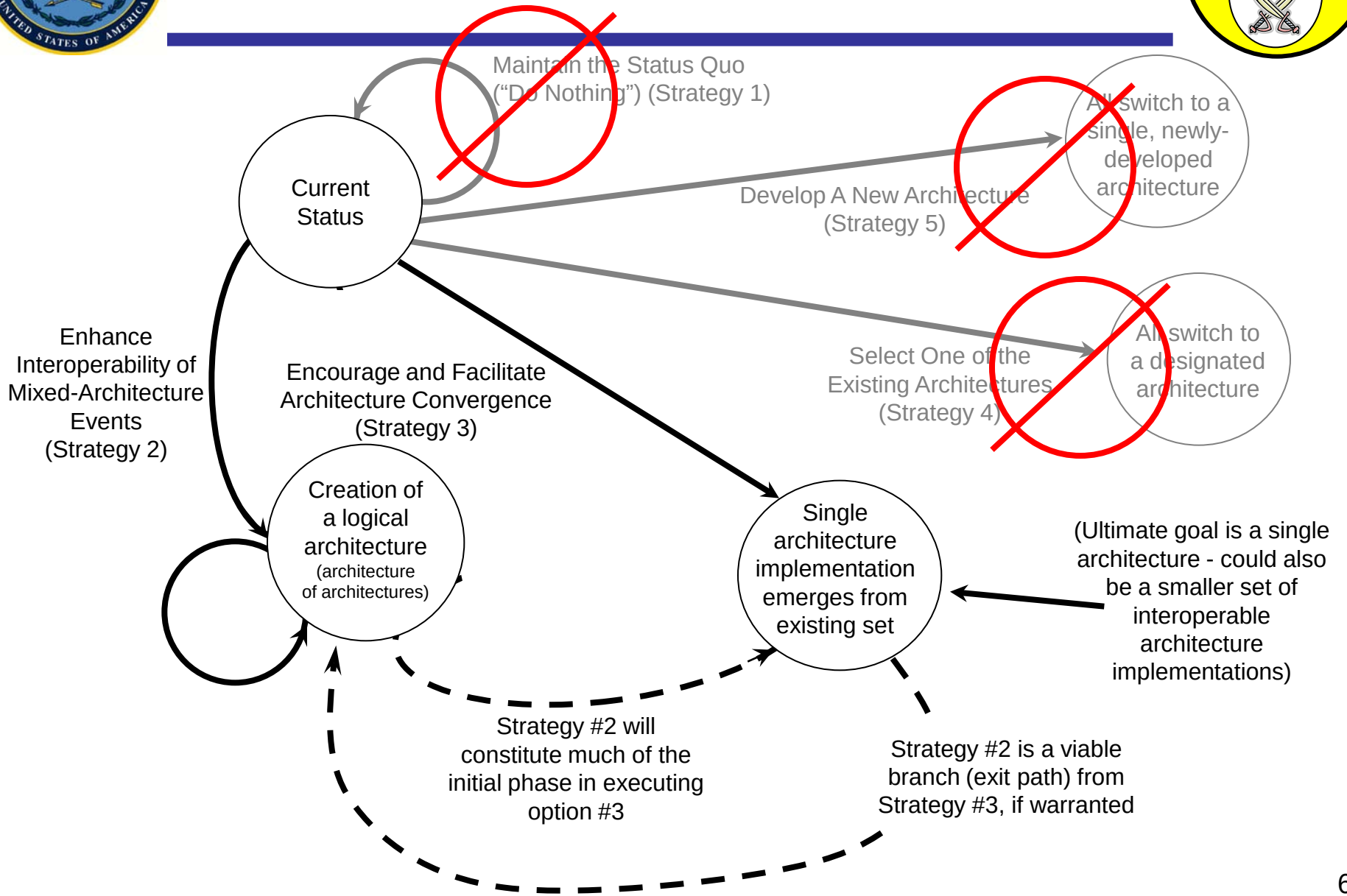
Numerous, Parallel
Architectures
(HLA, DIS, CTIA, TENA)



How did we get here?

- Live, Virtual, Constructive Architecture Roadmap (LVCAR) Study
- Purpose: “Develop a future vision and supporting strategy for achieving significant interoperability improvements in LVC simulation environments.”
- Focus: Three dimensions of simulation interoperability
  - Technical Architecture
  - Business Models
  - Standards Evolution and Management Process
- Precepts That Guide Implementation
  - Do no harm
  - Interoperability is not free
  - Start with small steps
  - Provide central management
- Result: A set of recommendations that guide HLT S-C-2

How did we get here?



Where are we going?

Focus: Pursue recommendations identified in the Live, Virtual, Constructive Architecture Roadmap (LVCAR) report sponsored by the OSD Modeling & Simulation Steering Committee (M&SSC)

		Investments	*Initial Investment*	*Bounds of 10-year Investment*	*Coordinated by*
Architecture Activities	1	Common components of architecture-independent object models	5 MY	5 - 20 MY	RET
	1	**Describe and document a common, architecture-independent systems engineering process**	**2.1 MY**	**2.1 - 9.6 MY**	**RET**
	1	Create common, reusable federation agreement template	1.7 MY	1.7 - 7.7 MY	RET
	2	**Analyze, plan and implement improvements to the processes and infrastructure supporting M&S asset reuse**	**1.8 MY**	**7.7 MY**	**MSSC and RET**
	2	Produce and/or enable reusable development tools	3.8 MY	3.8 – 15.8 MY	RET
	1	**RRI – Convergence feasibility determination and design**	**7 MY**	**N/A**	**TAT**
	3	Convergence plan	.8 MY	.8 - 3.7 MY	RET
	3	**Convergence implementation**	**RRI dependent**	**RRI dependent**	**RET**
	1	Produce common gateways and bridges	4.25 MY	4.25 - 17 MY	RET
	2	**Specify a resource or capability to facilitate pre-integration systems readiness**	**5.2 MY**	**5.2 - 21.7 MY**	**RET**
Standards Activities	2	Make IEEE standards more accessible to LVC community.	50K – 150K	N/A	MSSC
	1	**Engage SISO and the broader LVC community**	**1 MY, $200K**	**10 MY, $2M**	**MSSC**
	2	Coordinate activities and fund participation in commercial standards development groups	2 MY	20 MY	MSSC
	1	**RRI - Increase sphere of influence in SISO**	**1 MY**	**N/A**	**MSSC**
	1	Develop evolutionary growth path for LVC standards	1 MY	N/A	MSSC
Business Activities	1	**Identify LVC Keystone**	**TBD**	**TBD**	**MSSC**
	1	RRI – Balance the marketplace	1 MY	N/A	TAT
	3	**Balance the marketplace**	**RRI dependent**	**RRI dependent**	**MSSC**
Management Activities	1	Decision Support Data	1 MY	10 MY	MSSC

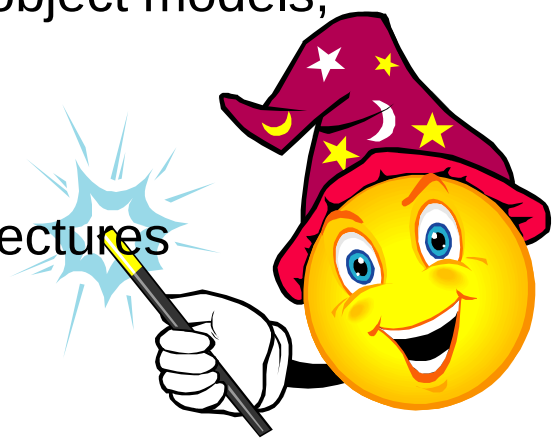
TASK	ACTIVITY
1	Arch-Independent Object
2	Common Capabilities (Reuse)
3	Architecture Convergence
4	Bridges & Gateways
5	Management & Standards

Where are we going?

- **Approach**
  - **Reduce** LVC architecture divergence and tool proliferation
  - **Identify** organizational and structural (e.g. use of standards) options to better manage LVC architecture interoperability
  - **Create** reference models to focus data and service reuse efforts
  - **Explore** emerging technology issues related to future LVC architecture performance and requirements

Where are we going?

- **Desired Results**
  - **Standardized** bridges and gateways to link architectures
  - **Convergence** of LVC architecture activities and reuse libraries
  - **Commonality** in federation templates, object models, engineering processes
  - **Initiatives** to pursue translational architectures



How are we getting there?

M & S SC

LVCAR Study

Identifies Areas of Investment

(FY09 Phase 1)

IMPLIMENT LVCAR

MANAGING THE LVC ENVIRONMENT

CONVERGE THE LCV ARCH

COMMON LVC CAPABILITIES

COMMON LVC GATEWAYS & BRIDGES

ARCH IND OBJECT MODEL

(FY10 Phase 2)

LVCAR CORE ARCHITECTURE

Tool Box
Arch Ind Data Formats
Library/Depository
Dev Tools
LVC Capabilities
STD Gateways
STD Bridges

Net-Centric
•SOA
•Sim Interface

(FY11 Phase 3)

LVCAR Exit Strategy

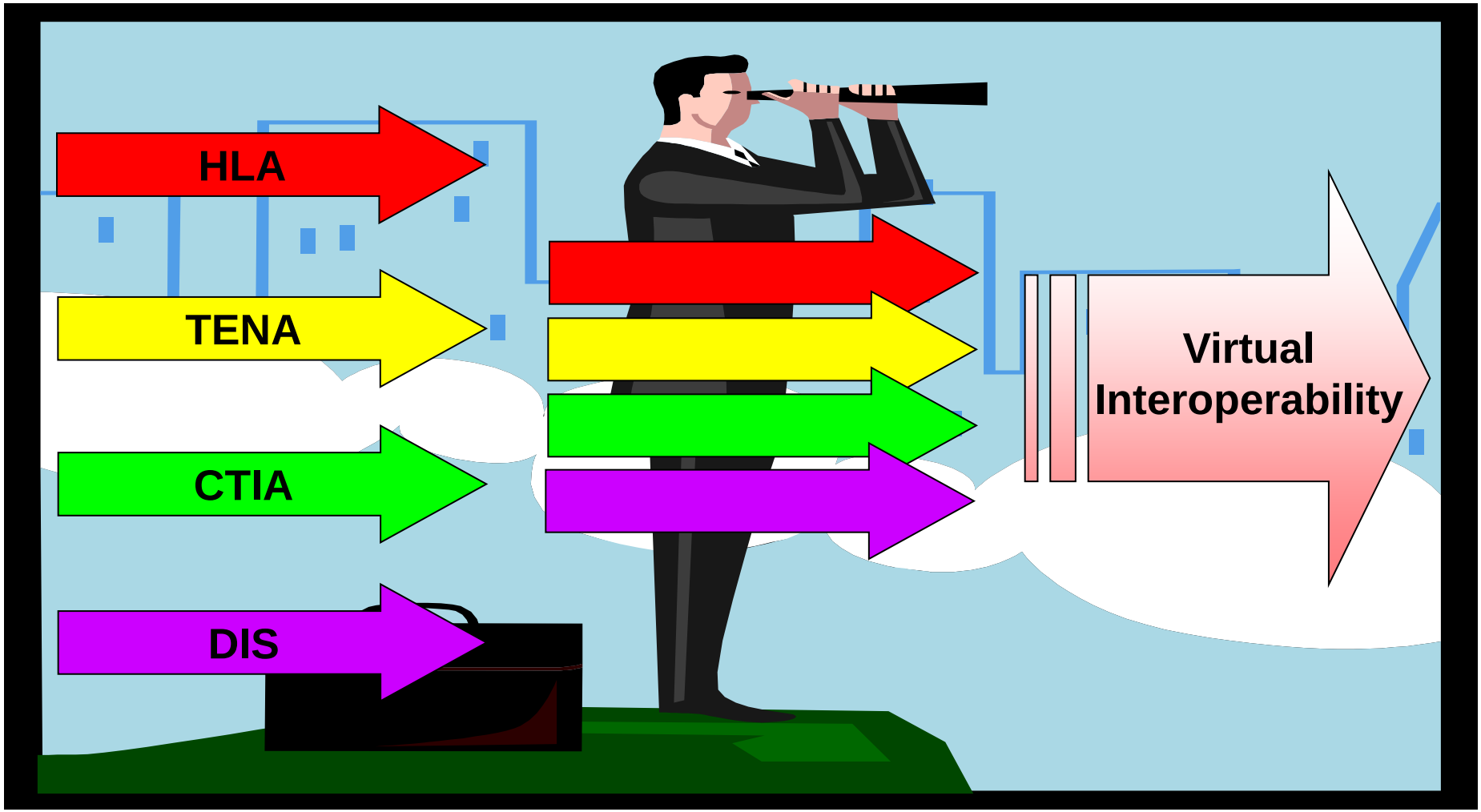
•Business Models
•Policies
•Standards
•Utilities

(FY12)

M & S COMMUNITY

Why are we doing this?

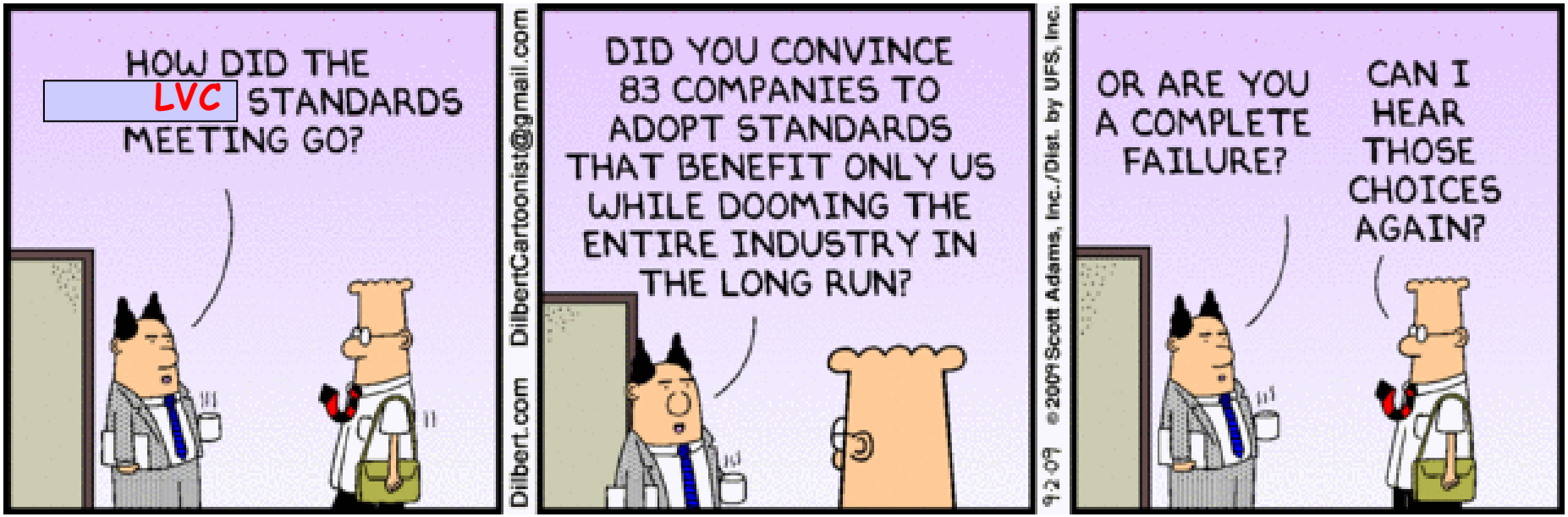
Why are we doing this?



Summary

- JTIEC and M&S CO have established a productive and collaborative working relationship
- Currently S-C-2 HLT has no major performance, schedule or cost issues
- S-C-2 Project Manager focus is to carry forward the recommendations from the defining LVC Architecture Roadmap study to the ultimate benefit of the readiness of our warfighters.

Discussion



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