Achieving Better Buying Power through Cost-Sensitive Acquisition of Open Architecture Software Systems

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Overview

- Recent trends in open architecture (OA) software systems

- Emerging challenges in achieving *Better Buying Power* (BBP) via OA software systems

- New practices to realize cost-effective acquisition of OA software systems

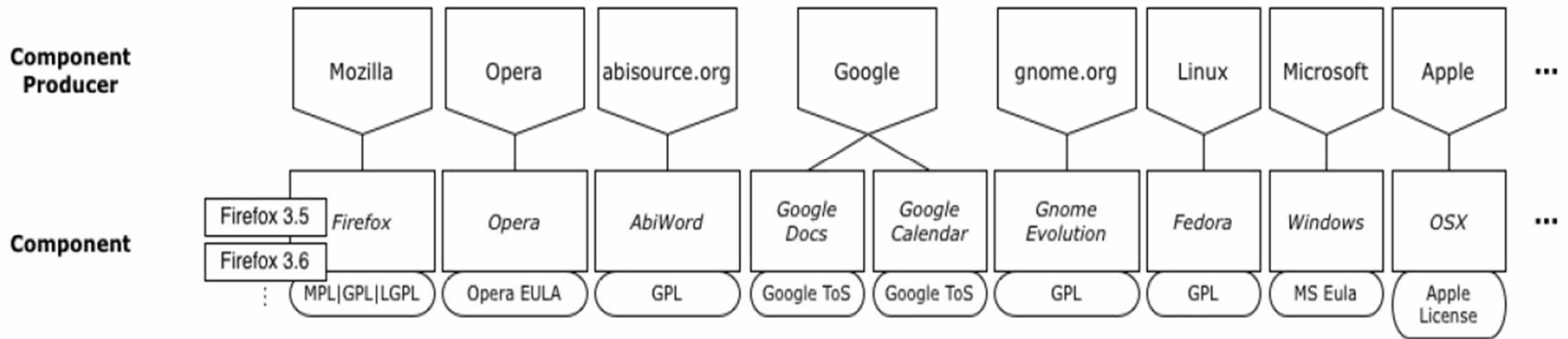- Conclusions

Recent trends in OA software systems

- Multi-party acquisition and OA development ecosystems

- Shared development of Apps and Widgets as OA system components

- Growing diversity of challenges in cybersecurity

- New business models for OA software component development and use

Multi-party acquisition and OA development ecosystems
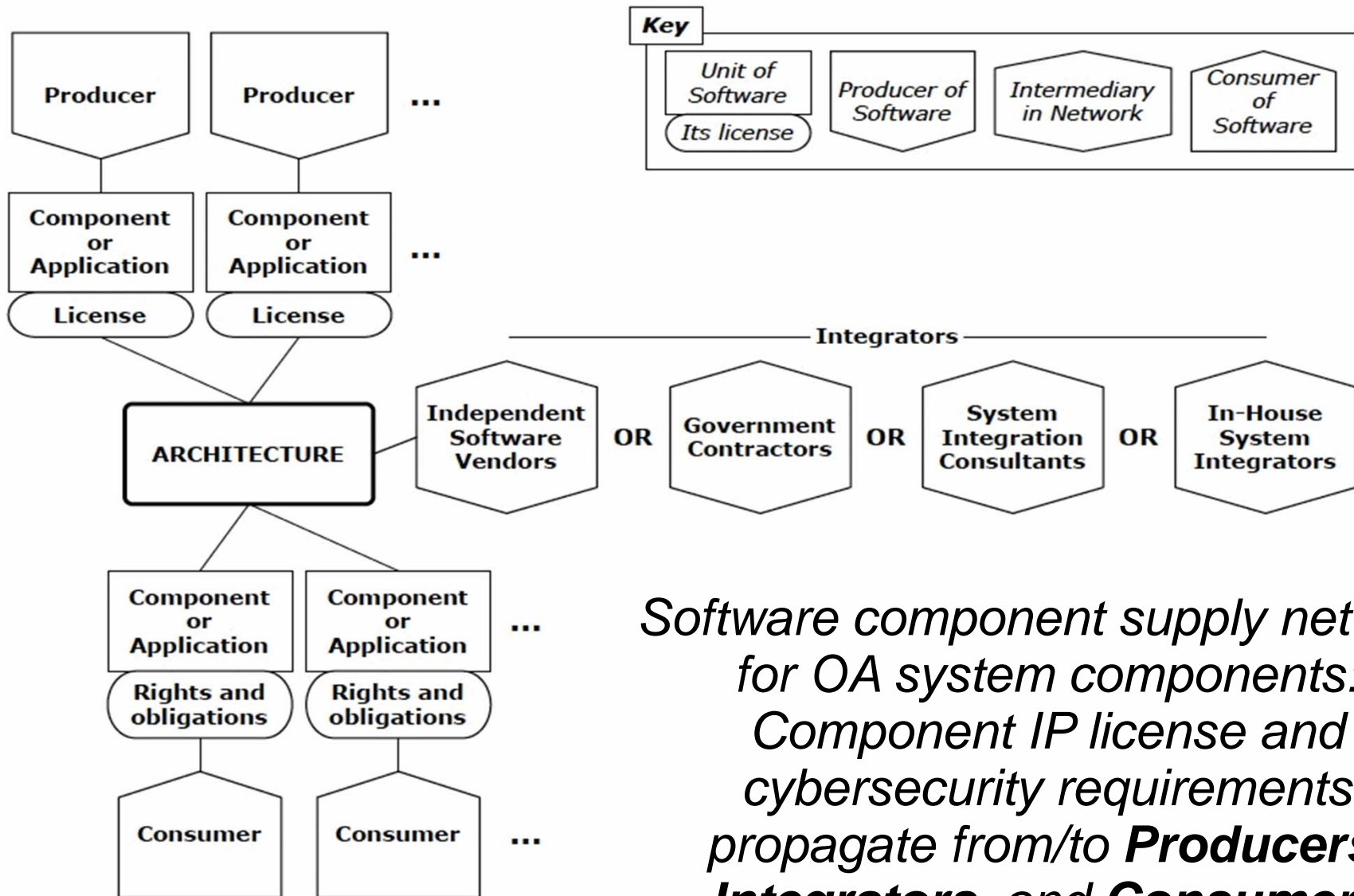
Software component supply network for OA system components: Component IP license and cybersecurity requirements propagate from/to **Producers, Integrators,** and **Consumers**
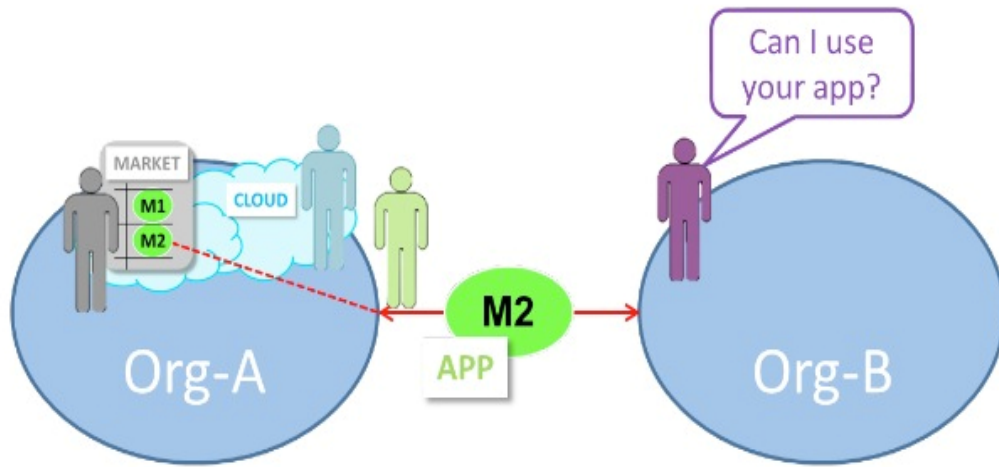
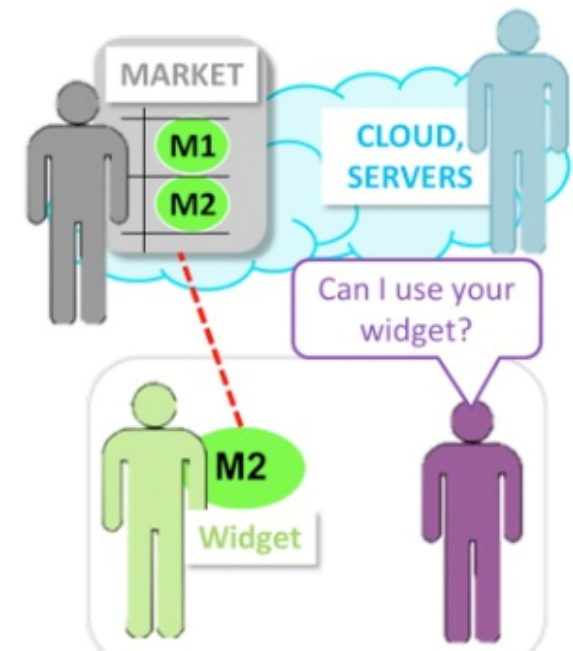# Multi-party acquisition and OA development ecosystems

A sample elaboration of producers (vendors), software component applications, and IP licenses for OA system components.

Multi-party acquisition and OA development ecosystems

Consumer/End-User Organizations now looking for ways to reduce acquisition cost and effort through shared development/use of common OA software system components (apps, widgets).

Shared development of Apps and Widgets as OA system components
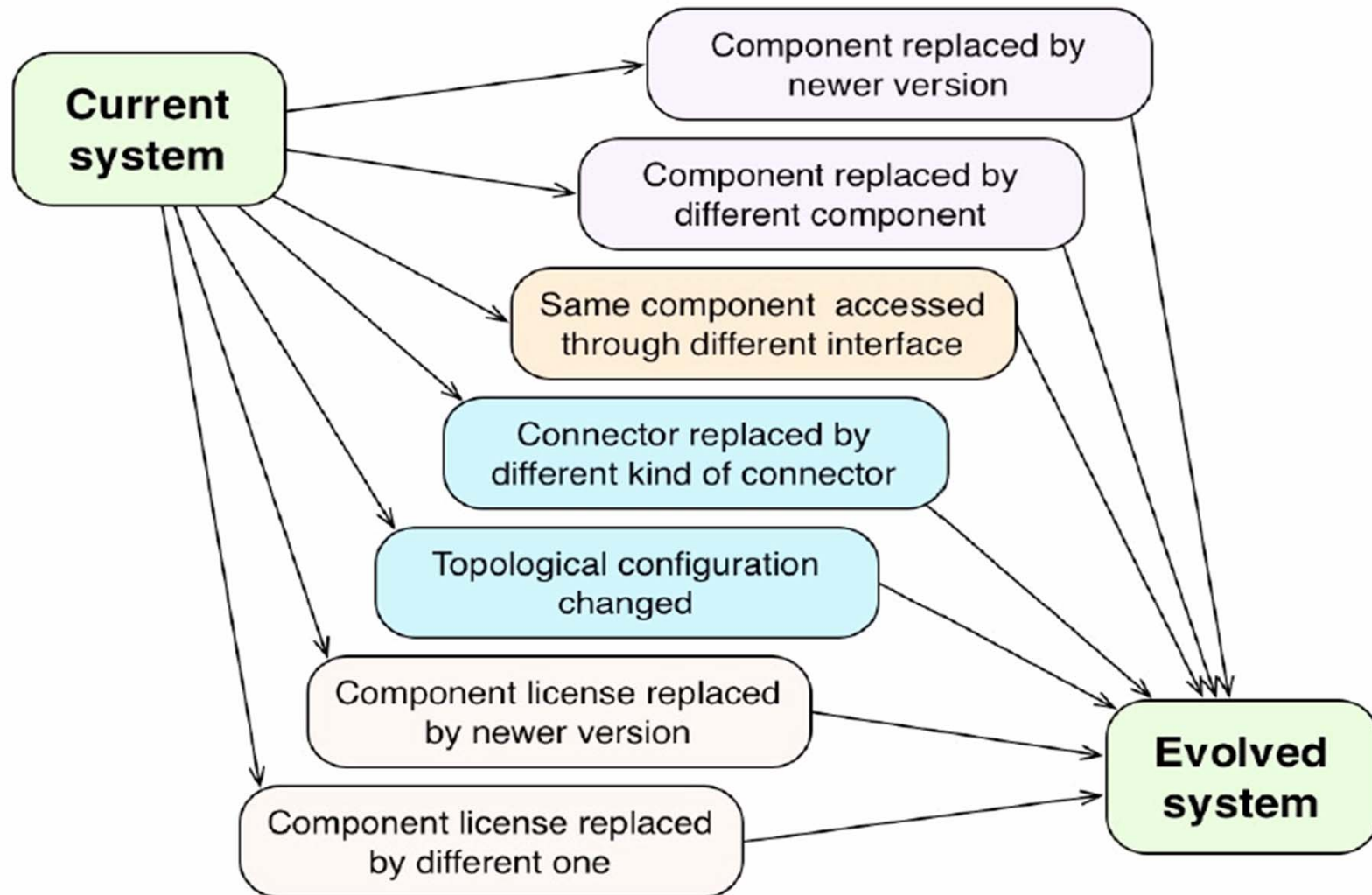

Ozone Widget Framework for Web PCs and Mobile Devices

Multi-party acquisition and OA development ecosystems: *Multiple OA system evolution paths*

IP and cybersecurity requirements will need continuous attention!

Growing diversity of challenges in cybersecurity

- Scacchi, W. and Alspaugh, T. (2012) Addressing Challenges in the Acquisition of Secure Software Systems with Open Architectures, *Proc. 9th Acquisition Research Symposium*, Vol. 1, 165-184, Naval Postgraduate School, Monterey, CA.

- Scacchi, W. and Alspaugh, T. (2013a). Processes in Securing Open Architecture Software Systems, *Proc. 2013 Intern. Conf. Software and System Processes*, San Francisco, CA, May 2013.

- Scacchi, W. and Alspaugh, T.A. (2013b). Streamlining the Process of Acquiring Secure Open Architecture Software Systems, *Proc. 10th Annual Acquisition Research Symposium*, Monterey, CA, 608-623, May 2013.

- Scacchi, W. and Alspaugh, T.A. (2013c). Challenges in the Development and Evolution of Secure Open Architecture Command and Control Systems, *Proc. 18th Intern. Command and Control Research and Technology Symposium*, Paper-098, Alexandria, VA, June 2013.

Shared development of Apps and Widgets as OA system components: *Cybersecurity?*

CAS Sign In

App Launcher

Ozone Mobile Drawer Menu

Ozone Widgets supporting "Bring Your Own Devices" (BYOD)?

New business models for OA software components

- Franchising

- Enterprise licensing

- Metered usage

- Advertising supported

- Subscription

- Free component, paid

  service fees

- Federated reciprocity for shared development
- Collaborative buying
- Donation
- Sponsorship
- (Government) open source software
- and others

Managing acquisition costs will be demanding. Acquisition workforce will need automated assistance, *else acquisition management costs will dominate development costs for OA software components!*

Emerging challenges in achieving BBP via OA software systems

- Acquisition program managers/staff *may not understand* how software IP licenses affect OA system design, and vice-versa.

- Software IP and cybersecurity obligations and rights propagate across system development, deployment, and evolution activities *in ways not well understood* by system developers, integrators, end-users, or acquisition managers.

- *Failure to understand* software IP and cybersecurity obligations and rights propagation can reduce DoD buying power, increase software life cycle costs, and reduce competition.

- DoD and other Government agencies *would financially and administratively benefit* from engaging the development and deployment of an (open source) automated software obligations and rights management system for the acquisition workforce.

New practices to realize cost-effective acquisition of OA software systems

- Need to R&D **worked examples** of reference OA system models, and component evolution alternatives.

- Need **open source models of** app/widget security assurance **processes and** reusable cybersecurity **requirements.**

- Need precise **domain-specific languages** (DSLs) and **automated analysis tools** for continuously assessing and continuously improving cybersecurity and IP requirements for OA C2 systems composed from apps/widgets.

Conclusions

- Our research identifies how new software component technologies, IP and security requirements, and new business models interact to drive-down or drive-up acquisition costs.

- New technical risks for component-based OA software systems can dilute the cost-effectiveness of BBP efforts.

- Need R&D leading to automated systems that can model and analyze OA system IP licenses and cybersecurity requirements
  - Empower the acquisition workforce
  - Identify and manage cost-effectiveness trade-offs

Acknowledgements

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