Emerging Issues in the Acquisition of Open Source Software

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Overview

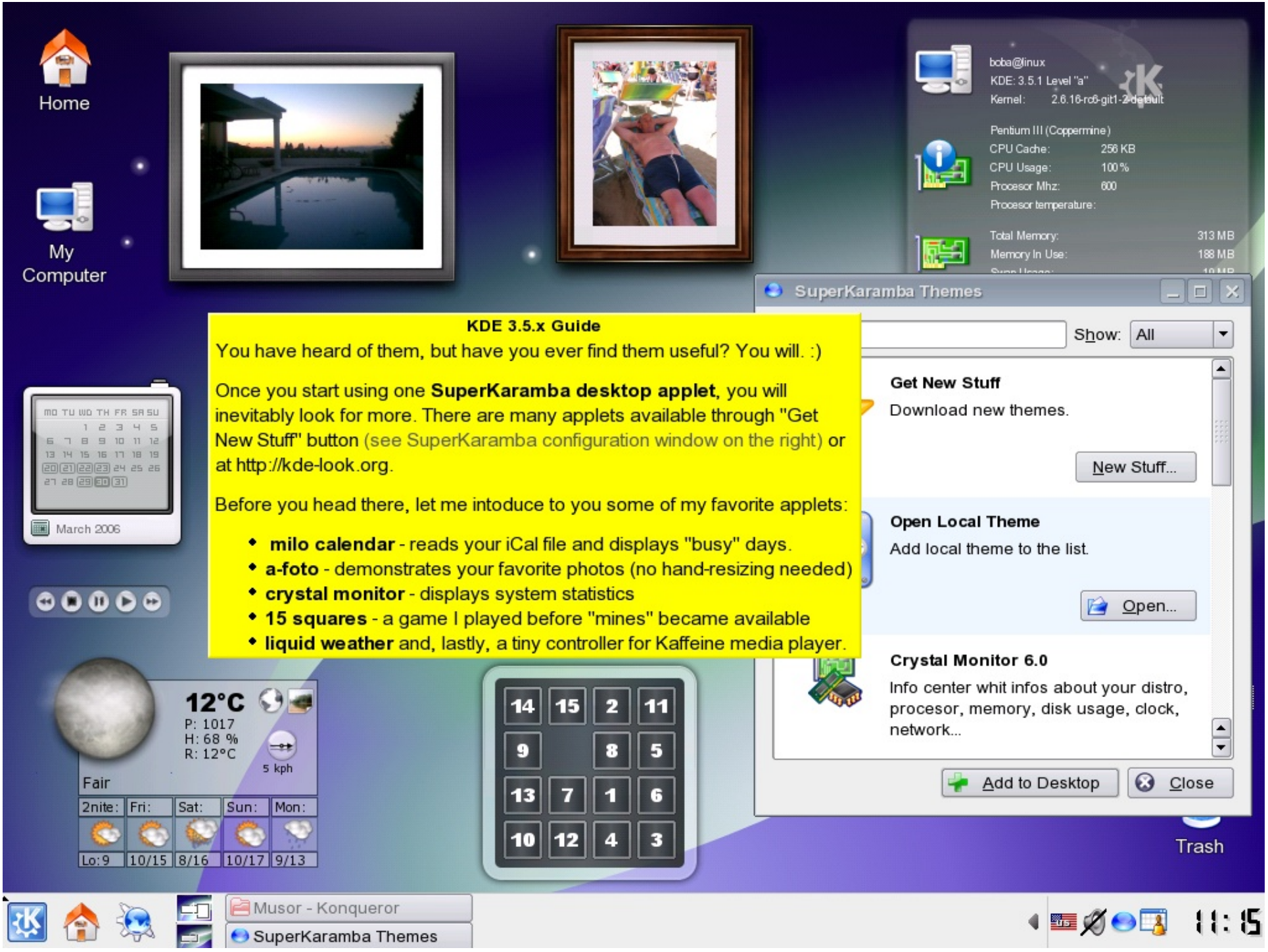
- Background
- Understanding open software architecture concepts
- How open source software (OSS) licenses complicate architecture and acquisition
- Emerging requirements for Open Architecture systems with OSS elements
- Conclusions

Background

- *Goal*: identify principles of software architecture and open source software (OSS) licenses that mediate open architecture (OA).
- OSS elements subject to different licenses can facilitate or inhibit OA.
- DoD policies and initiatives encouraging OA with OSS elements
- What additional requirements are needed to realize OA strategies with OSS?

Background (continued)

- "Open is the new Correct"
  - Overall system correctness depends on the correctness of its components and how they are interconnected.
  - Testing/V&V and use determine correctness.
  - However, not all OA incorporating OSS components and interconnections will be open.
  - OA using OSS elements creates new system acquisition requirements


Home
My Computer
boba@linux
KDE: 3.5.1 Level "a"
Kernel: 2.6.16-rc6-git1-2-default
Pentium III (Coppermine)
CPU Cache: 256 KB
CPU Usage: 100 %
Procesor Mhz: 600
Procesor temperature:
Total Memory: 313 MB
Memory In Use: 188 MB
SuperKaramba Themes
Show: All
Get New Stuff
Download new themes.
New Stuff...
Open Local Theme
Add local theme to the list.
Open...
Crystal Monitor 6.0
Info center whit infos about your distro, procesor, memory, disk usage, clock, network...
Add to Desktop
Close
KDE 3.5.x Guide
You have heard of them, but have you ever find them useful? You will. :)
Once you start using one SuperKaramba desktop applet, you will inevitably look for more. There are many applets available through "Get New Stuff" button (see SuperKaramba configuration window on the right) or at http://kde-look.org.
Before you head there, let me intoduce to you some of my favorite applets:
milo calendar - reads your iCal file and displays "busy" days.
a-foto - demonstrates your favorite photos (no hand-resizing needed)
crystal monitor - displays system statistics
15 squares - a game I played before "mines" became available
liquid weather and, lastly, a tiny controller for Kaffeine media player.
March 2006
12°C
P: 1017
H: 68 %
R: 12°C
5 kph
Fair
2nite: Fri: Sat: Sun: Mon:
Lo:9 10/15 8/16 10/17 9/13
14 15 2 11
9 8 5
13 7 1 6
10 12 4 3
Trash
Musor - Konqueror
SuperKaramba Themes
11:15

Was that an Open Architecture?

Open Software Architecture Concepts

- Software source code components
  - Standalone programs
  - Libraries, frameworks, or middleware
  - Inter-application script code
  - Intra-application script code
- Executable software components
- Application program interfaces (APIs)
- Software connectors
- Configured system or sub-system

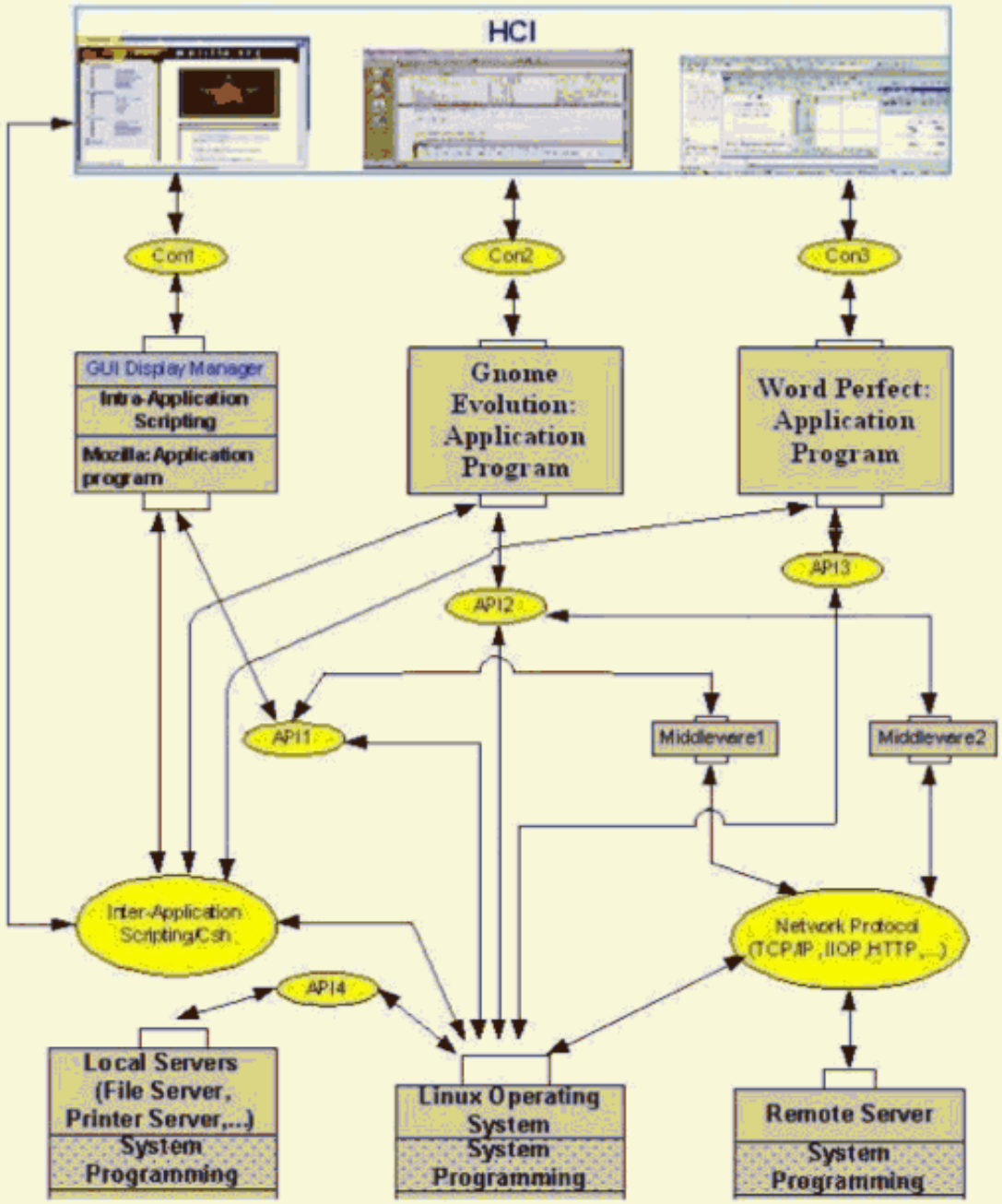


Figure 1. Software components, connectors, interfaces arranged in an overall software system configuration. Components, connectors, and overall system configuration may be subject to different software licenses.

OSS License Mapping Complications

CONTRIBUTION		DERIVATIVE WORK				
		GPL	MPL	CPL	OSL	Academic
	BSD	yes	no[1]	no[2]	yes	yes[3]
	MIT	yes	no[1]	no[2]	yes	yes[3]
	Apache	yes[4]	no[1]	no[2]	yes	yes[3]
	AFL	yes[4]	no[1]	no[2]	yes	yes[3]

Emerging Requirements for OA with OSS

- How much openness required / desired?
- Contractor guidelines and incentives to minimize OSS license obligations
- Determine restrictions on OA system from OSS component, connector, configuration licenses

Emerging Requirements for OA with OSS

- Identify alternatives that still satisfy a specific overall system architecture
- Scenarios to find license conflicts among OSS components, connectors, configuration
- Identify / analyze OSS licensing obligations that may block system redistribution

Alspaugh and Antón, "Scenario Support for Effective Requirements" Information and Software Technology ***50****(3), 2008*

Future Requirements for OA with OSS

- Requirements / architecture interaction
- V&V for OSS and OA
- OSS evolution
- Trading off reliability vs. cost / flexibility
- Openness to warfighter modification or participation

Diallo, Sim, and Alspaugh, "Case Study, Interrupted: The Paucity of Subject Systems that Span the Requirements-Architecture Gap" WEASELTech 2007

Diallo, Alspaugh, et al., "Toward Architecture Evaluation Through Ontology-based Requirements-level Scenarios" Architecting Dependable Systems V, 2008

Conclusions

- Acquisition goals of OSS and OA imply additional, non-obvious requirements
- Guidance for program officers in avoiding OSS pitfalls, achieving OSS benefits
- Guidelines and incentives for contractors in producing OA with OSS

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