ExplorViz: Visual Runtime Behavior Analysis of Enterprise Application Landscapes

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Enterprise application landscapes are complex systems
Enterprise models (EMs) seek to capture relevant information
Our observations
1) EMs often get outdated
2) Current approaches lack application-level detail
Approach

Introduction

▸ ExplorViz [FWWH13] provides live visualization of enterprise application landscapes

![ExplorViz](image)

▸ Used to **ensure consistency** between an enterprise model and the actual information systems

▸ Design Science as research methodology and its two main steps **Build and Evaluate**

▸ Exemplify our approach via **modeling** of an application landscape

▸ Exemplary **drill-down** to our EPrints operational installation
Related Work

- Research community around Matthes [Mat08]
  - Only relationships between applications and no details
- Research community around Leymann [BBKL13]
  - Do not provide details on the actual root cause
- City metaphor, e.g., Wettel et al. [WL07]
  - Only static analysis
- Application Performance Management (APM) tools, e.g., AppDynamics or dynaTrace
  - No abstractions from server and applications
Figure 1: Excerpt of our enterprise application landscape meta-model
Figure 2: Modeling the Kiel Data Management Infrastructure for ocean sciences
(a) EPrints with closed Screen

Figure 3: Application perspective visualizing the Perl-based EPrints
Application Perspective

ExplorViz Approach

Figure 3: Application perspective visualizing the Perl-based EPrints

(a) EPrints with closed Screen

(b) EPrints with opened Screen
Performance Analysis of EPrints

Applying ExplorViz

Figure 4: Visualizing the highest 1% of the product of average response time and the call count
Figure 5: Visualizing the communications of the DataObj.User class
Figure 6: Data processing in our ExplorViz approach [FWWH13]
- Application-level monitoring through AspectJ
- Adapter to read logs from other tools, e.g., Kieker \([\text{vHWH12}]\)
- Monitoring of remote procedure calls
Elastic Trace Analysis

ExplorViz Implementation

- Live processing
- Millions of monitoring records per second in enterprise landscapes
- Cost-efficient through cloud scaling

Figure 7: Multiple levels of analysis workers
ExplorViz Implementation

- Web browser as front end
- WebGL as rendering technology
- Generating JavaScript through Google Webkit Tool (GWT)¹

¹http://www.gwtproject.org

Summary and Outlook

Conclusions

- Live trace visualization of enterprise application landscapes
- Application monitoring to ensure consistency between the EMs and the real systems
- Open source web-based tool²

ExplorViz

Future Work:

- Improving the 3D layout algorithm
- More advanced filters increasing the analysis capability

²http://www.explorviz.net


R. Wettel and M. Lanza. Program comprehension through software habitability.