

Game Flux Analysis with Provenance



Context

- Analysis Process
 - Technical Issues
 - Gameplay Mechanics
- Beta Testing
 - Indispensable Source of Data
 - Artisanal
 - Volunteers
 - Superficial Analysis



toonlet.com/creator/theomosalon

13 nov 09, 6:22 PM

Motivation

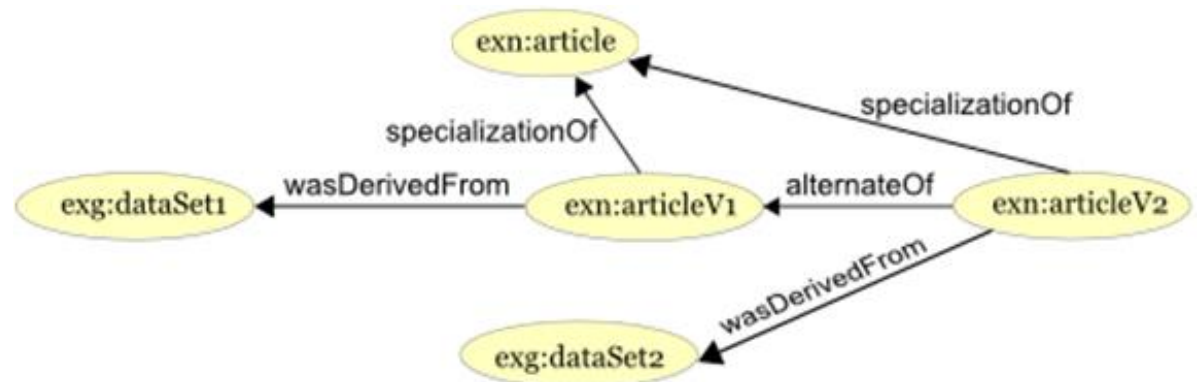
- Cause-and-Effect
 - How to detect?
 - How to display?
- Archeology, Paleontology
 - Provenance



Provenance

“Refers to the documented history of an art object, or the documentation of processes in a digital object’s life cycle”

- Provenance Graph
 - Causality Graph
- Models:
 - OPM (2007)
 - PROV (2010)



<http://www.w3.org/TR/prov-primer/>

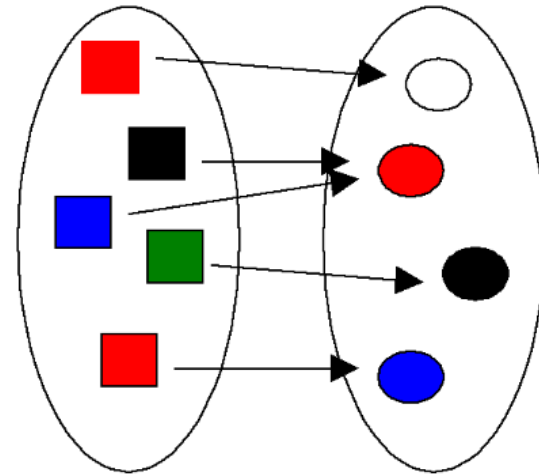
Goals

- Cause-and-Effect Relationships
 - Detect
 - Extract
 - Display
- Assist
 - Detect Gameplay Issues
- Visualization
 - Game Session Provenance



Provenance in Games

- Previous Work
- Conceptual Framework
- Map Domains
 - Provenance to Games
- Gather
 - Provenance Information



Provenance Gathering

- Entity
 - Objects
- Activity
 - Actions
 - Events
- Agent
 - NPCs
 - Player



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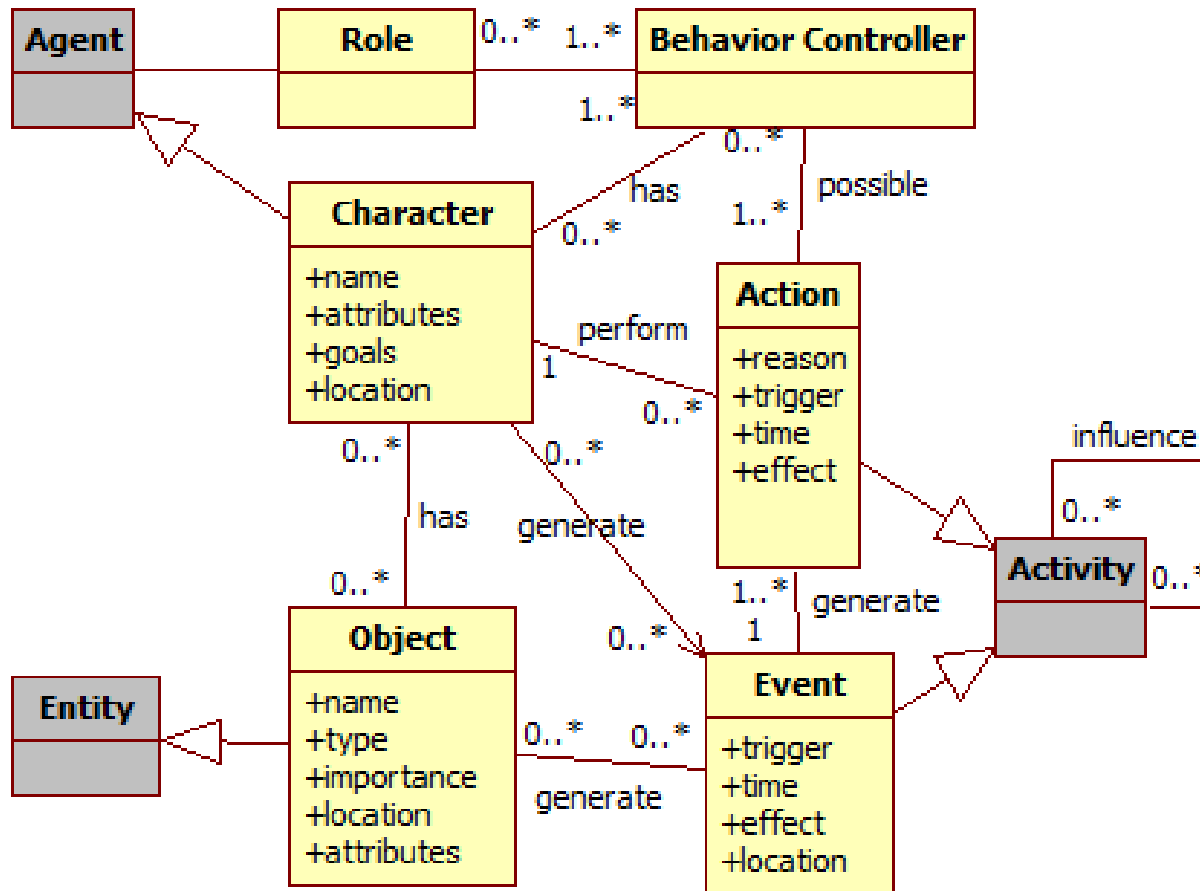


Provenance Gathering

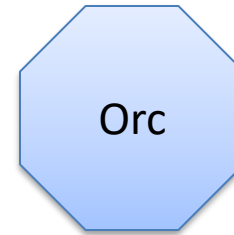
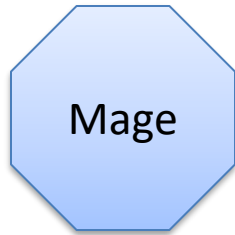
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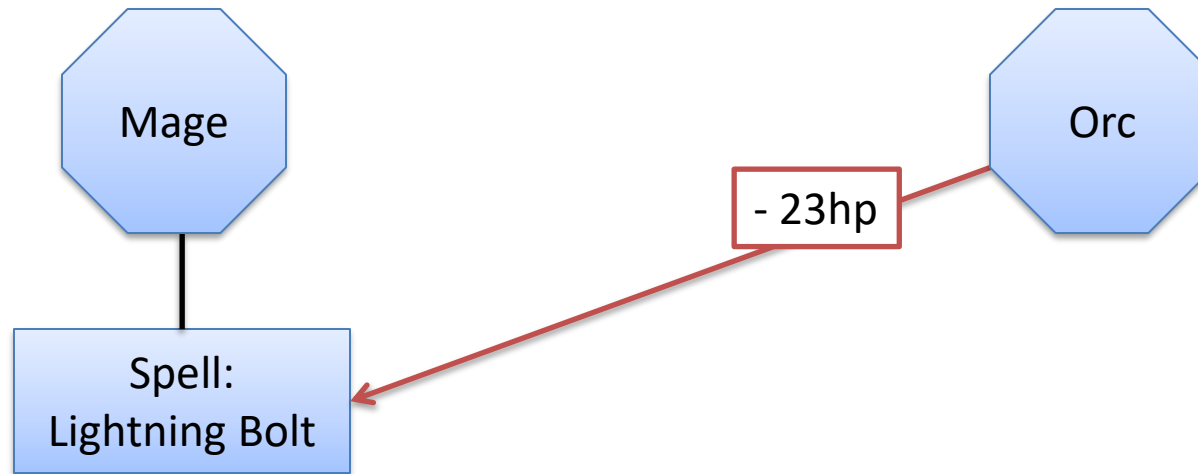
Provenance to Games



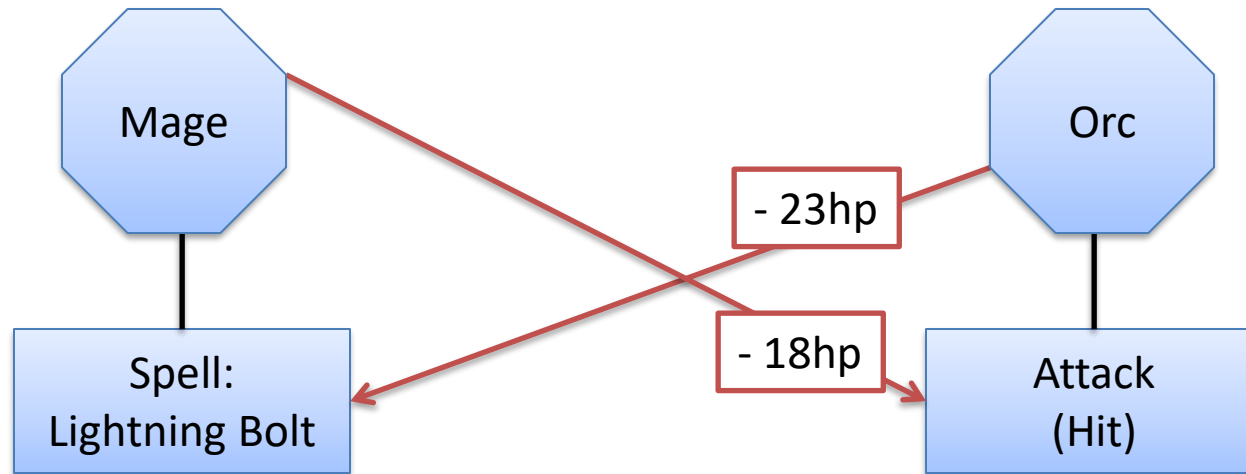
Graph Construction



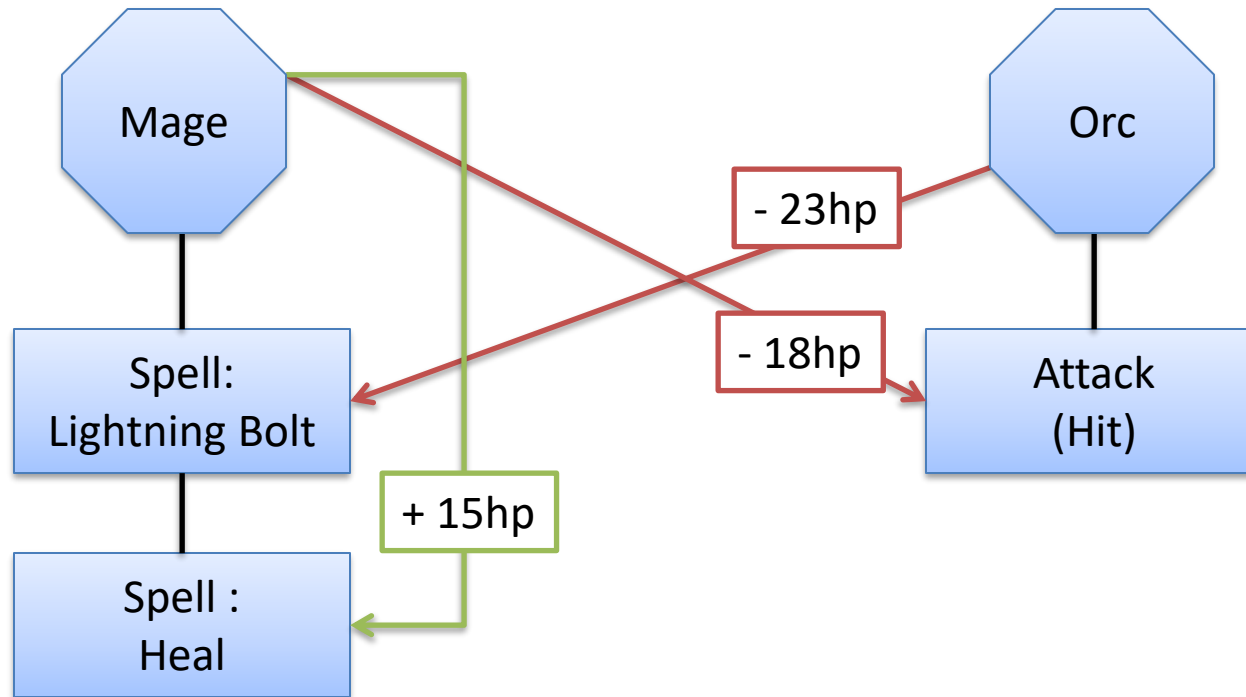
Graph Construction



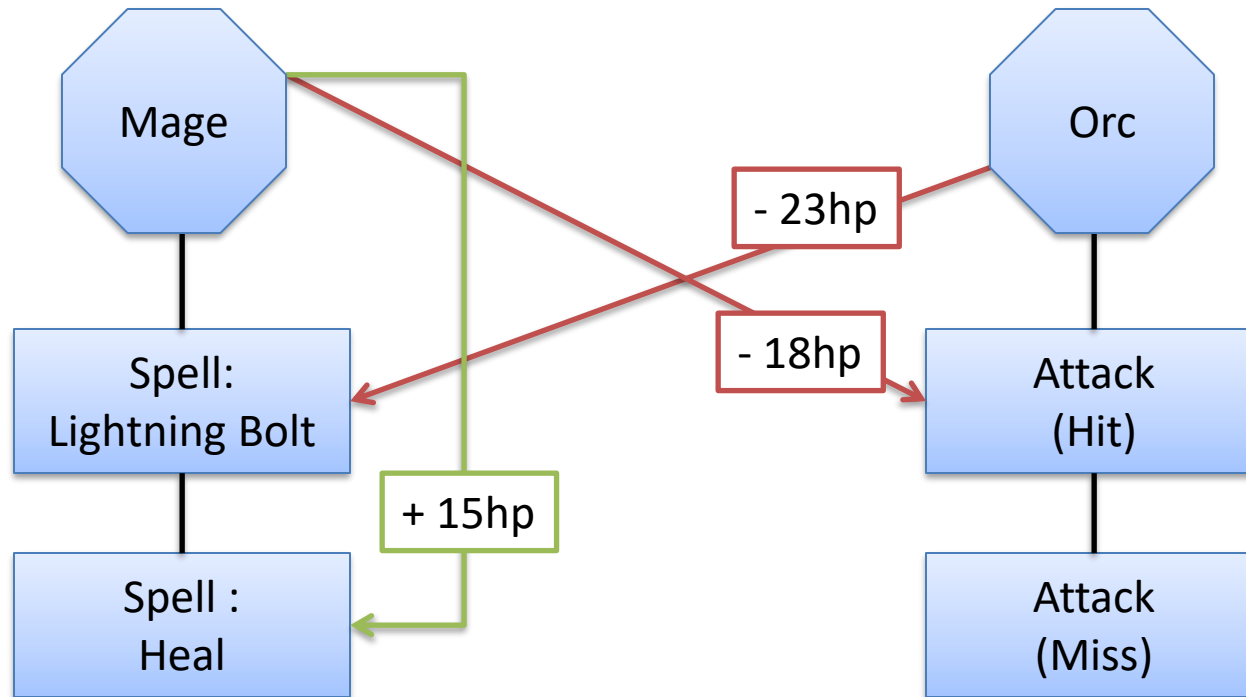
Graph Construction



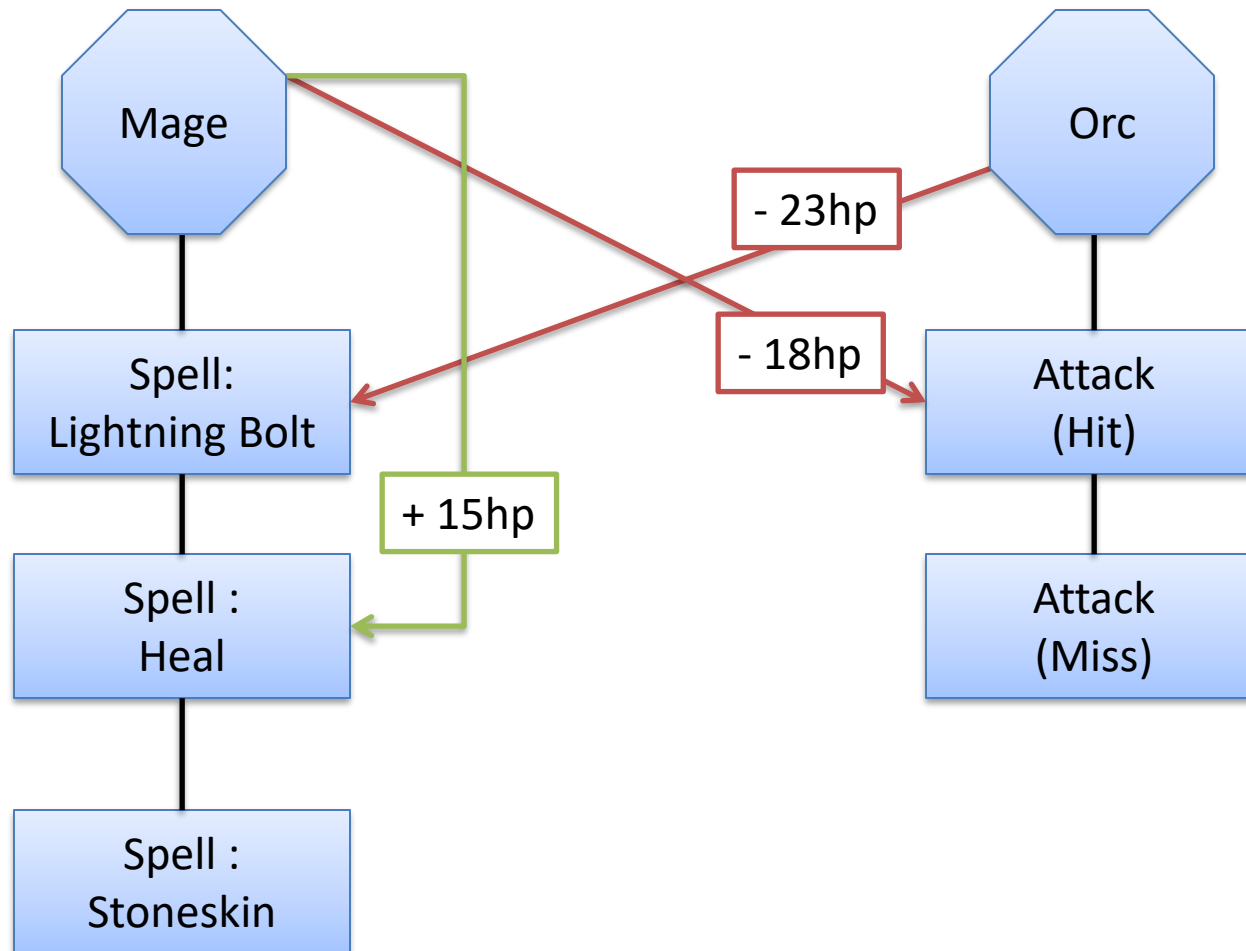
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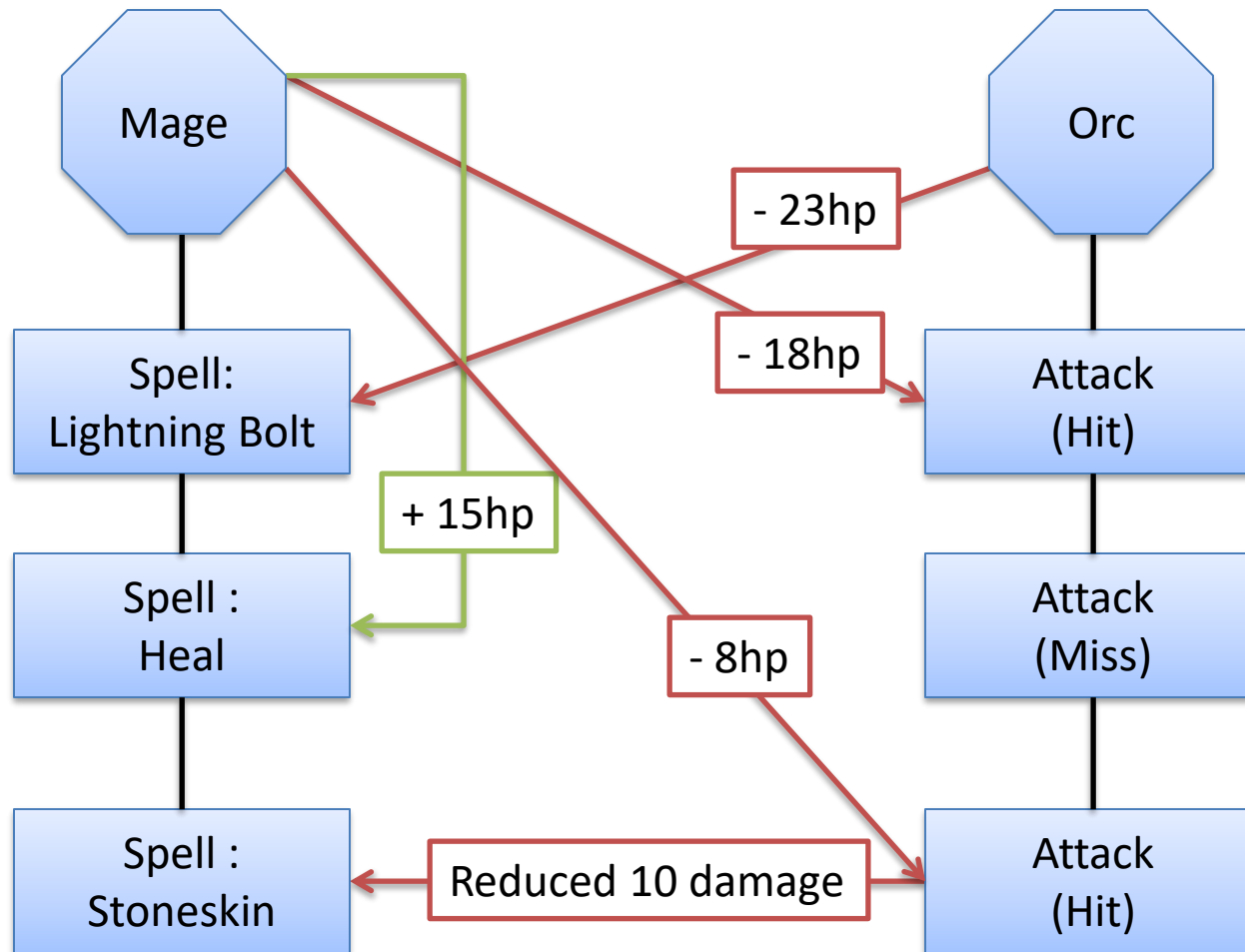
Graph Construction



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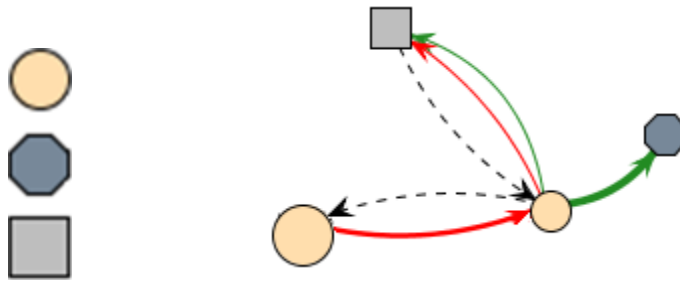
Graph Construction



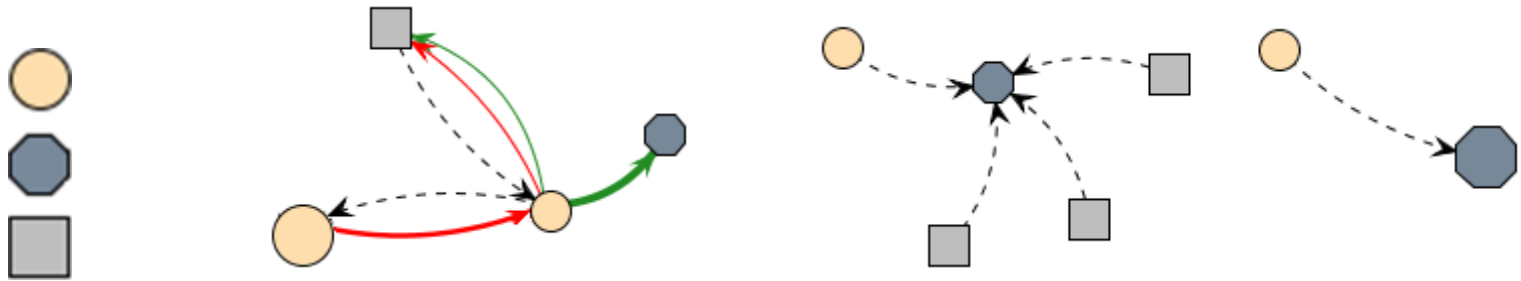
Provenance Visualization



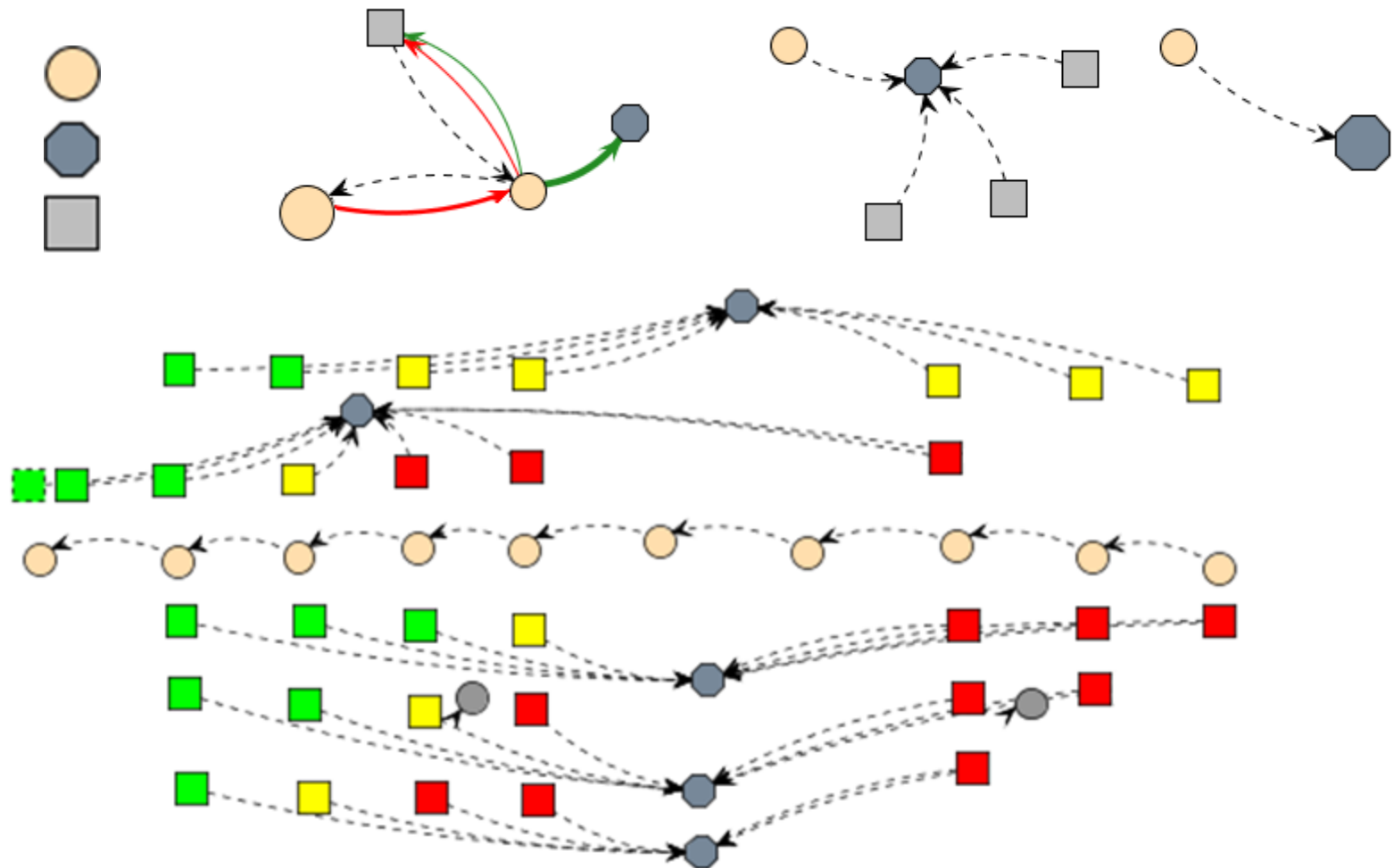
Provenance Visualization



Provenance Visualization



Provenance Visualization



Case Study

Staff's Settings

Language: java
Methodology: Agile

Staff Team

Jorus Manager None	Henry Analyst None	Bron Programmer None	Frede Marketing None	Keyan Analyst None	Jacob Programmer None	Ethan Architect None	Sera Tester None
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Staff's Hours

Daily: 8
Set

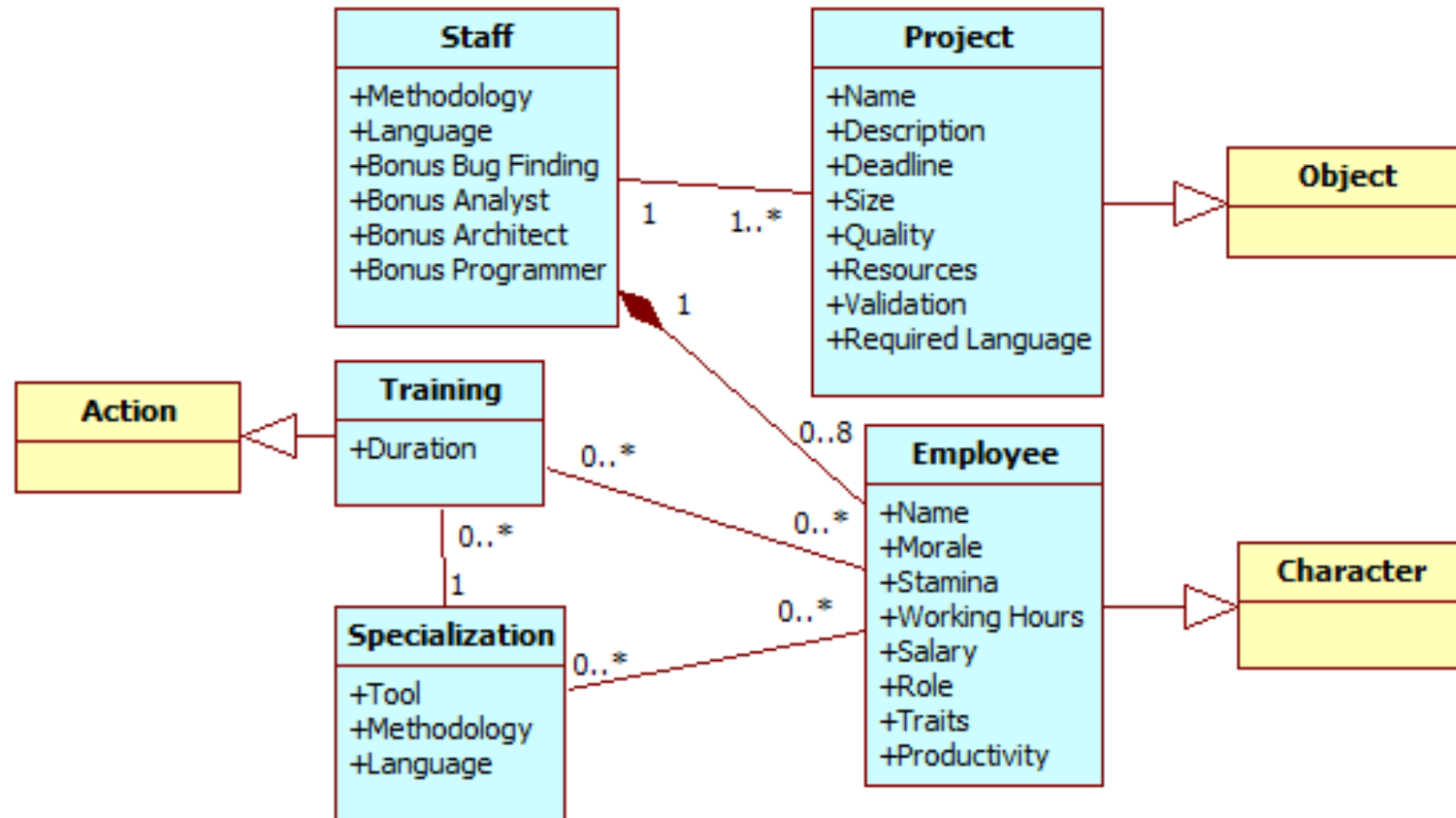
Expenses:	Morale	Stamina:	
Jorus :	\$215	88%	100%
Henry :	\$211	76%	100%
Bron :	\$394	52%	80%
Frede :	\$175	64%	100%
Keyan :	\$250	52%	100%
Jacob :	\$247	52%	100%
Ethan :	\$442	52%	68%
Sera :	\$376	52%	92%
Daily :	\$2310		
Monthly :	\$64790		
Income in:	28Days		

PAUSED

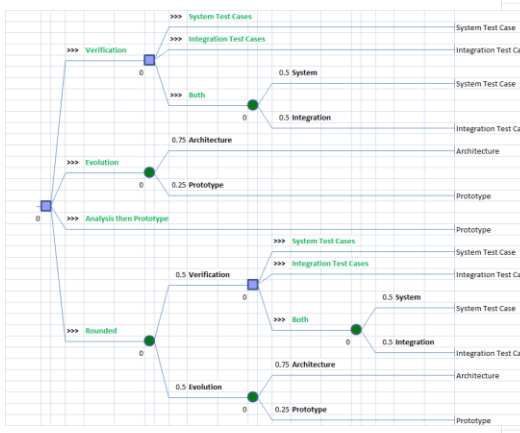
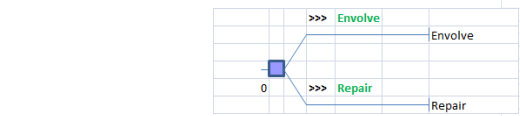
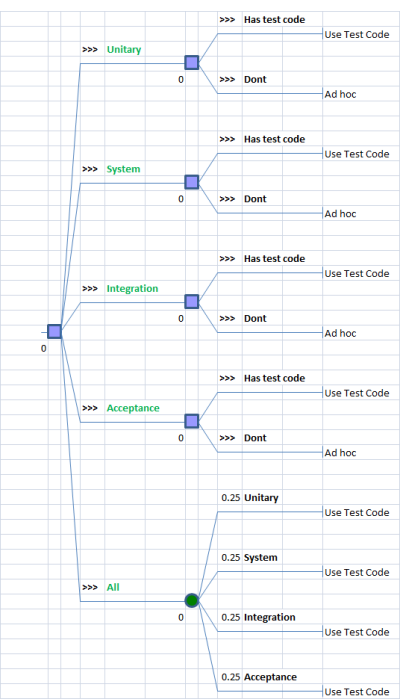
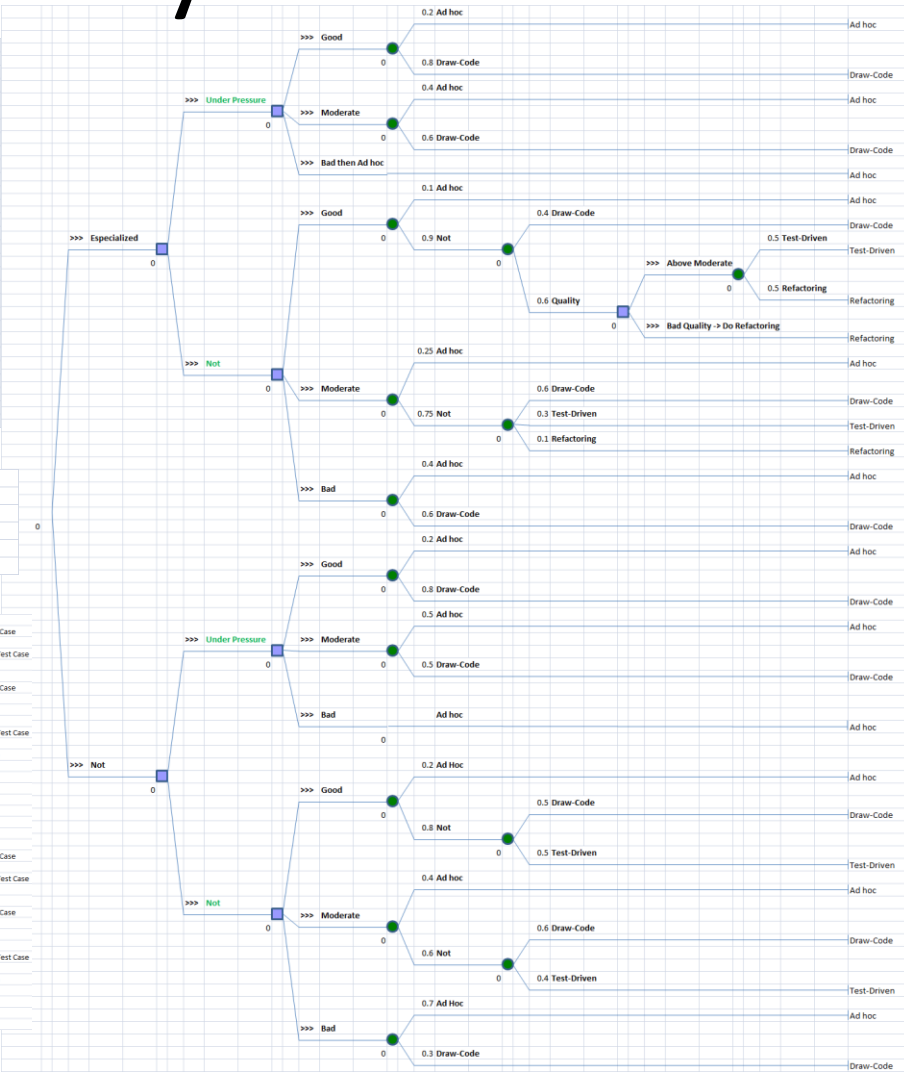
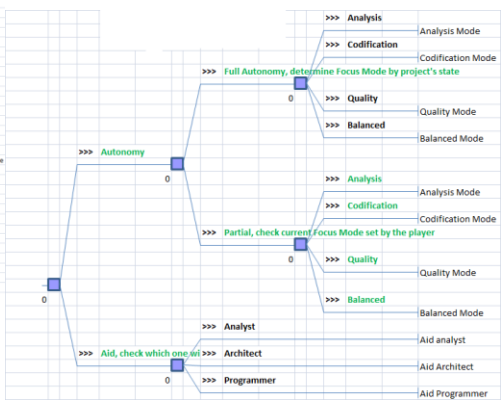
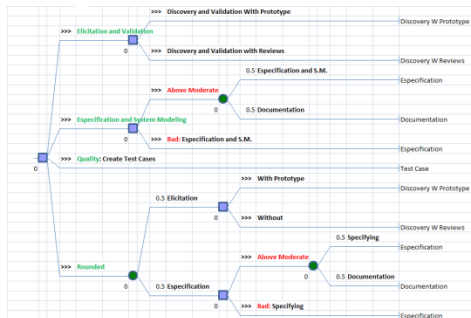
Credits	\$ 130	Time	Wk: 001 Day: Mon	Req. Done	0 %	# bugs	0
Monthly Inc.	\$ 15000	Deadline	Wk: 004 Day: Fri	Req. Modeled	0 %	Code Lang.	java
		Prototypes	0	Client's Req.	100 %	Quality	80 %

Pause Next Day Continuous Fast

Case Study



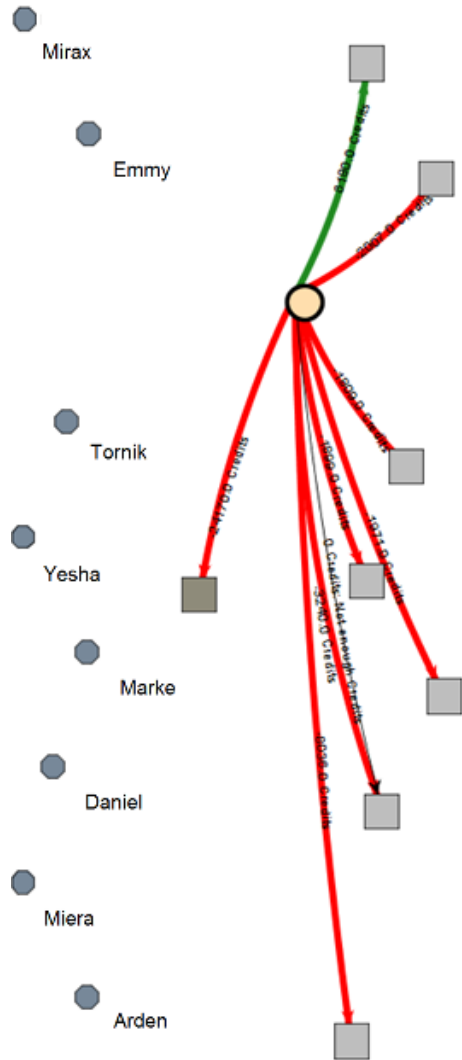
Case Study



Visualization Examples



Visualization Examples



Conclusion

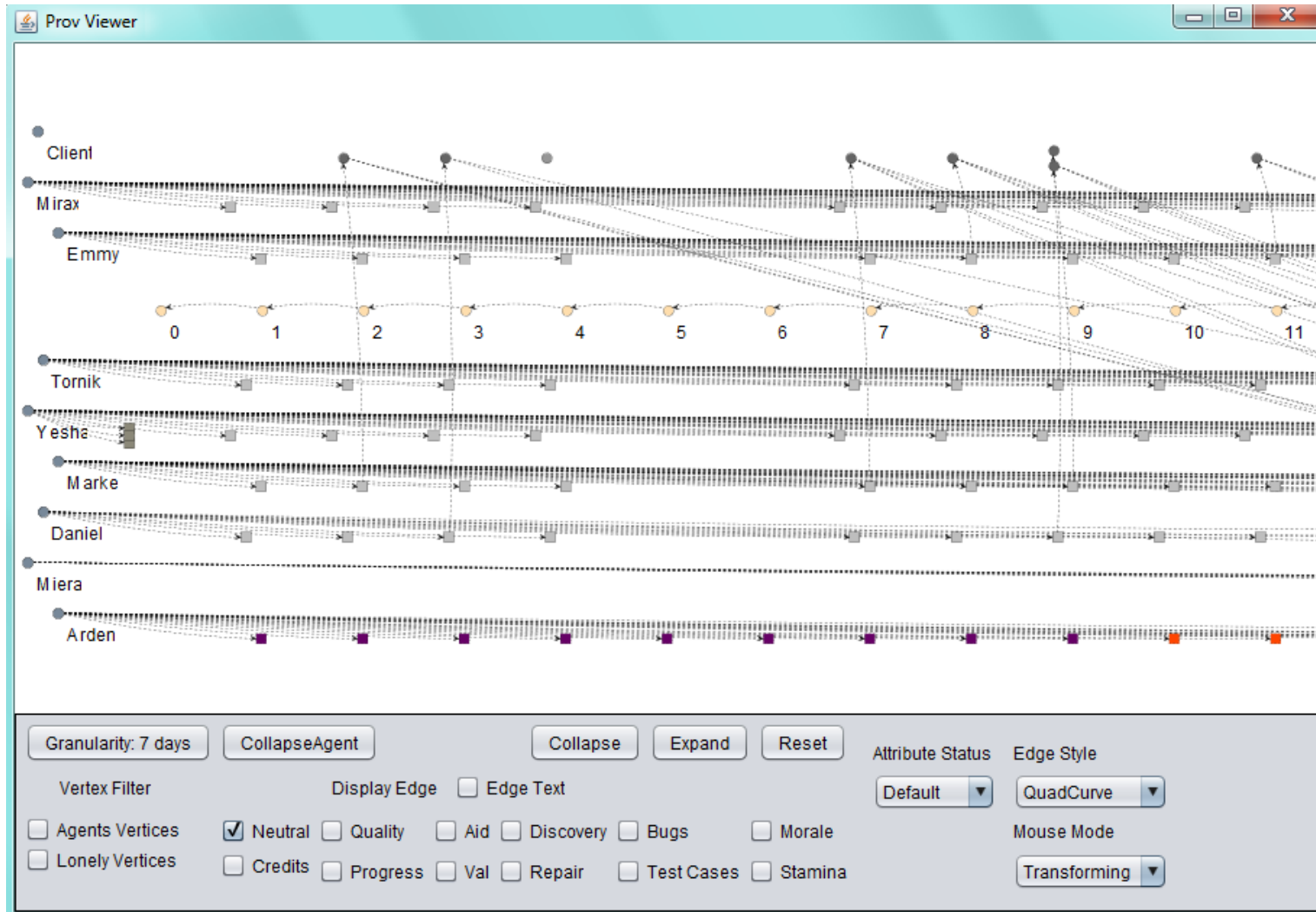
- Contributions
 - Rich Data Extraction
 - Broader Range of Analysis
 - Cause-and-Effect Relationships
 - Game Provenance Visualization
- Future Work
 - Automatic Inferences
 - Pattern Detection
 - Graph Layouts



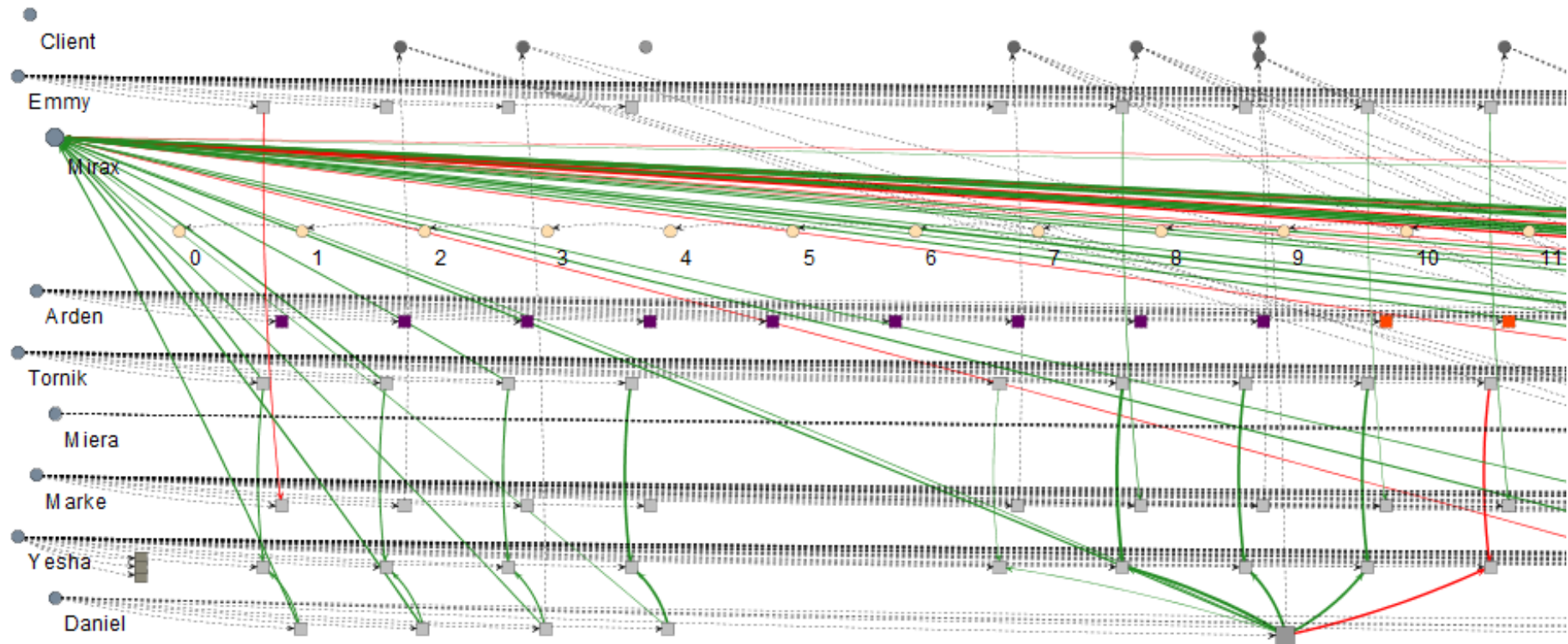
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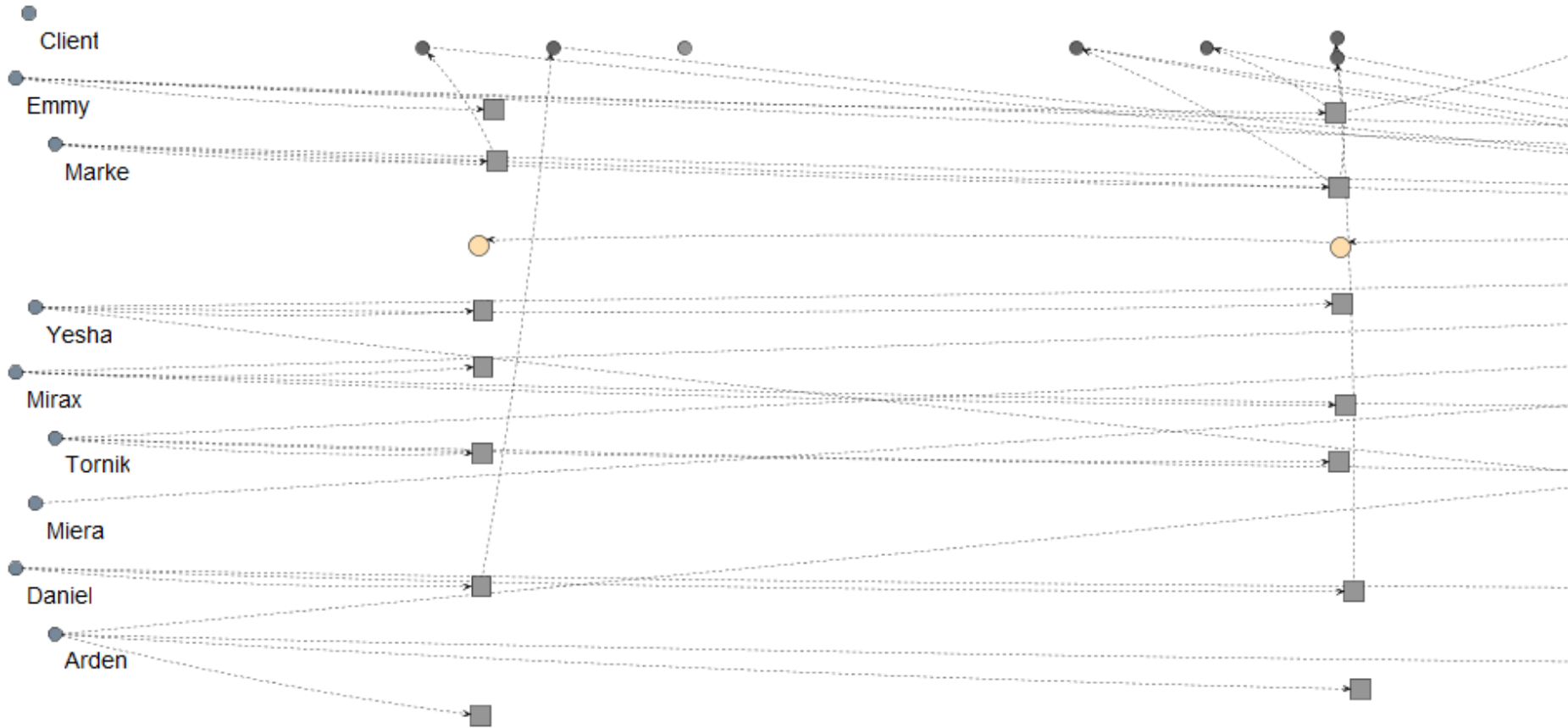
Visualization Examples



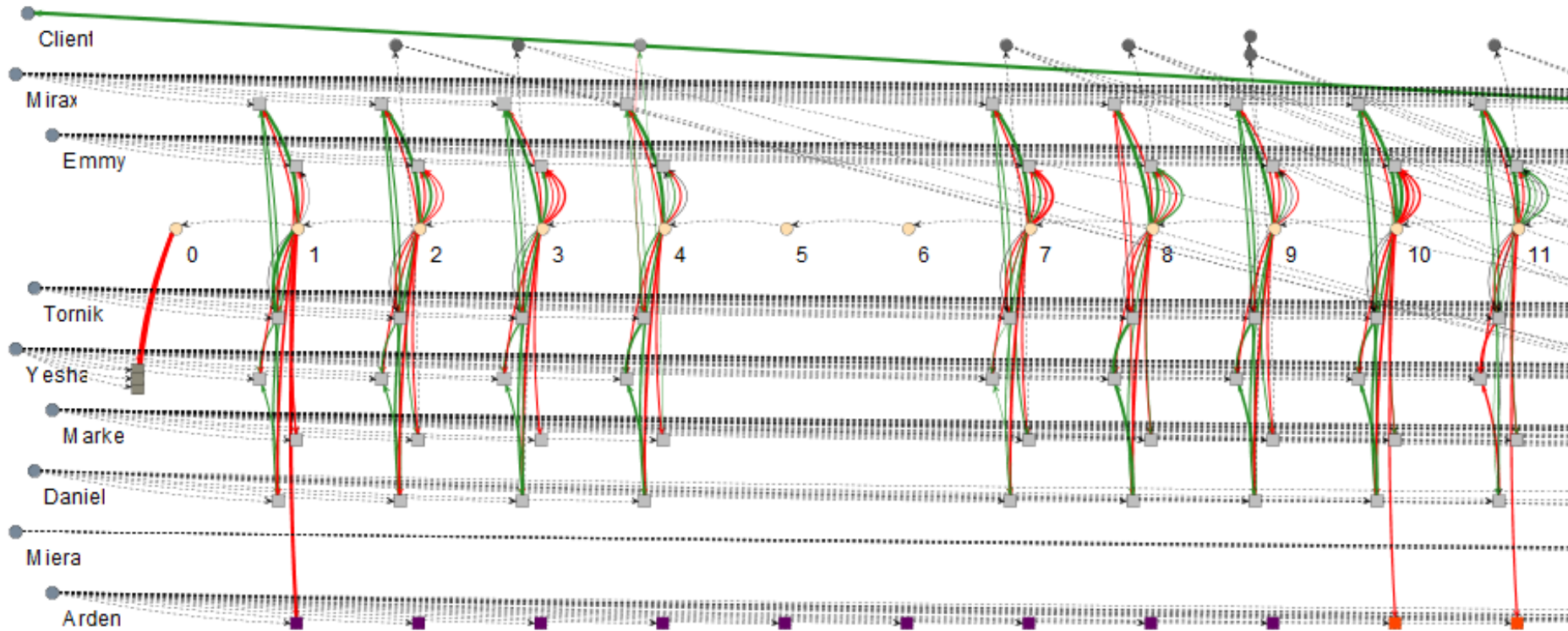
Visualization Examples



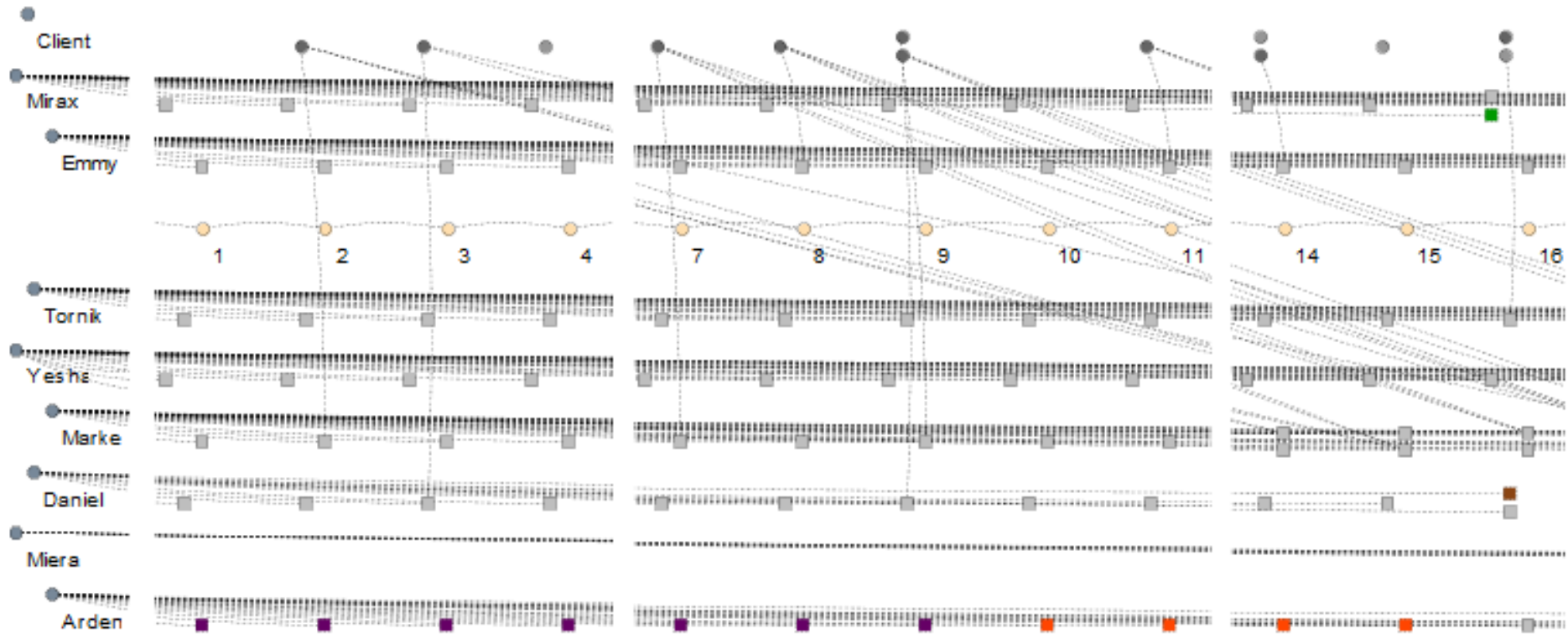
Visualization Examples



Visualization Examples



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Visualization Examples

