2. General Approach

- Obtain a bipartite socio-technical network
- Compute socio-technical concept lattice
  - Apply formal concept analysis (FCA) theory
  - Use free tool ConExp (Concept Explorer)
  - Input: bi-partite network
  - Output: concept lattice (1 node per concept)
  - A concept clusters all artefacts associated to the same people
  - Hierarchy is partial ordering of clusters (arc semantics: subset)
- Visualise hierarchy interactively using ConExp
- Study different and evolving socio-technical relations
  - Repeat 1.-3. for various relations and system releases

3. Example

4. Eclipse 1.0, assignees, $k = 10$

- Used higher $k$ because bug reports accumulate over time
- Geographical and workload distribution like release 1.0

5. Eclipse 3.0, assignees, $k = 100$

- Fewer people and components than in assignees lattice
  - Developers don’t discuss all reports they are assigned to

6. Eclipse 3.0, discussants, $k = 100$

- Novel application of Formal Concept Analysis
  - Clustering and ordering of socio-technical relations
  - General tool-supported approach
- Some advantages over bi-partite graphs
  - More scalable: not one node per person and artefact
  - More explicit: related people & artefacts in same node
  - More intuitive: uniform vertical layout & arc semantics
- Helps spot expertise and potential problems
  - Generalist and specialist people
  - Artefacts with too many or too few people associated
  - Undesired or absent communication/coordination

7. Conclusions

For more details, see our paper in Proc. ICSE’09 (companion volume), pp. 327-330.