Ausgewählte Kapitel aus Ubiquitous Computing (PI.AKM.AK.VU)

Seminar: Problems to solve
Problem: „The ubiquitous Grid“

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Grid Computing - Vision

- The Grid is a service for sharing computing power and data storage capacity over the Internet.
- Turn the global network of computers into one vast computational resource.
- All computers (all over the world and belonging to many different people) act as a single, huge and super-powerful computer.

[www.gridcafe.org]

Service Oriented Architectures

- Available Grid middlewares are often based on (but there is no solution covering all Grid computing problems…):

  Service Oriented Architectures (SOA)

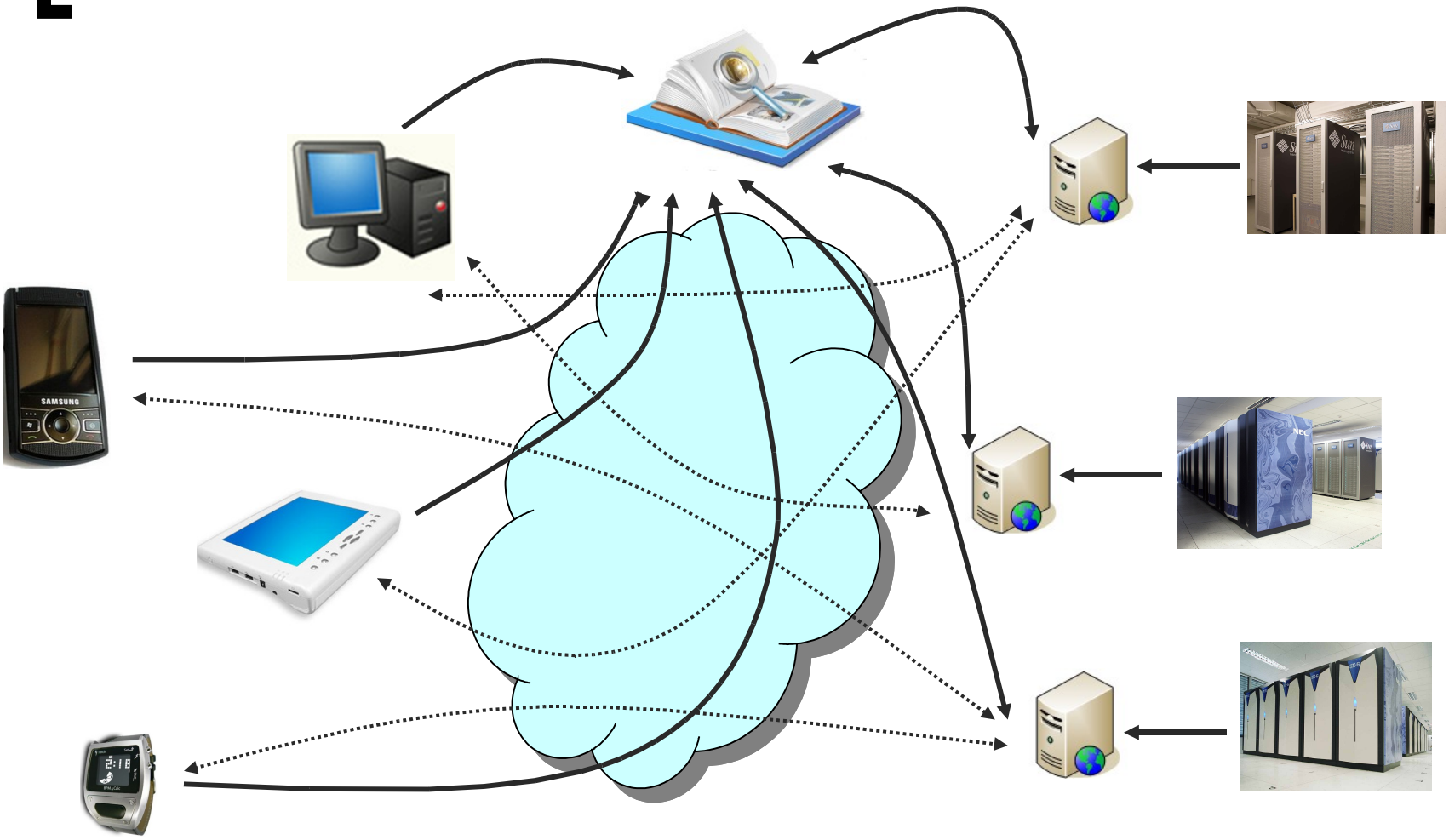
- Resources (applications, data sources) are encapsulated as Web Services
- Registries enable discovering appropriate Web Services

  [e.g.: Vienna Grid Environment http://www.par.univie.ac.at/project/vge/]

Problem Description

- Actual situation:
  - We have some services providing some applications or data (but where are services)
  - We have a registry for discovering services (but users have to know how to describe services)
  - We have client software available on desktop computers for accessing the stuff (not seamlessly integrated in different devices)
  - …and we have several gadgets available but not usable!

Problem Description - Vision



…an ubiquitous vision…

- Users can access services with every gadget from every place using several access protocols (Bluetooth, WLAN, UMTS…)
- Authentication and Authorization is done automatically by the device
- Results are temporarily stored for the user and are transparently available
  - from several devices
  - in a device specific format
- Services are chosen automatically due to the actual situation/location

…continued

- Users could have different possibilities using different devices
  - E.g.: Intelligent watch: Users can only query the state of a job
- Other devices could be used for authentication/authorization
  - E.g.: Use of smartcard
  - e.g: Use mobile phone for authentication communicating tokens via Bluetooth to the e.g. Asus EEE PC using this token to communicate via WLAN with the registry and the service provider

References

- GridCafe: www.gridcafe.org
- Vienna Grid Environment (VGE): http://www.par.univie.ac.at/project/vge/
- I. Foster et al. The Open Grid Services Architecture, Version 1.5., Open Grid Forum, GFD-I.080, July 2006
- Hingne, V.; Joshi, A.; Finin, T.; Kargupta, H.; Houstis, E., "Towards a Pervasive Grid," *Parallel and Distributed Processing Symposium, 2003. Proceedings. International* , vol., no., pp. 8 pp.-, 22-26 April 2003
- http://www.ubiq.com/ubicomp/
- Reading list, especially:
  - The computer for the 21st century
  - The coming age of calm technology
  - Beyond prototypes: challenges in deploying ubiquitous systems