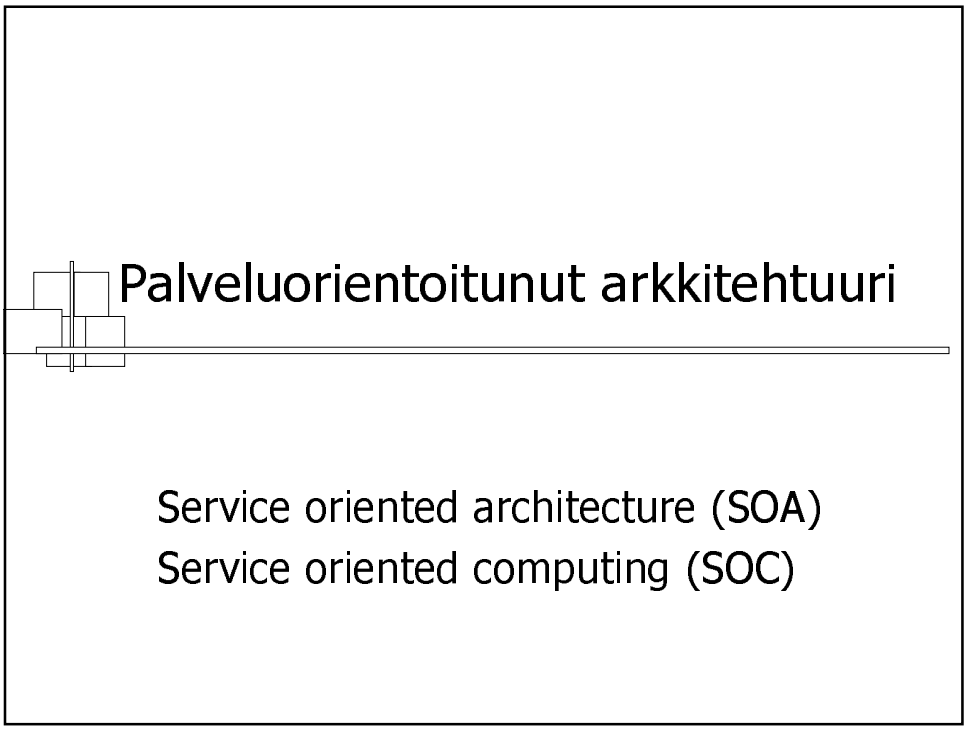
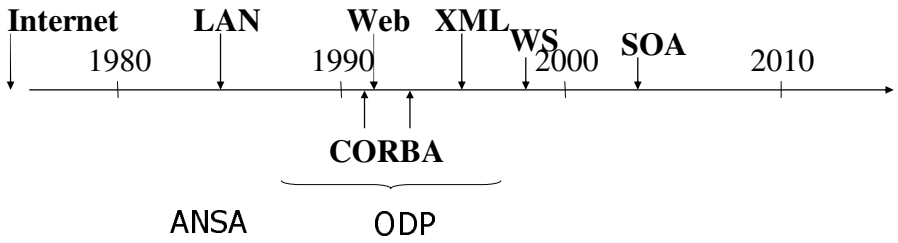
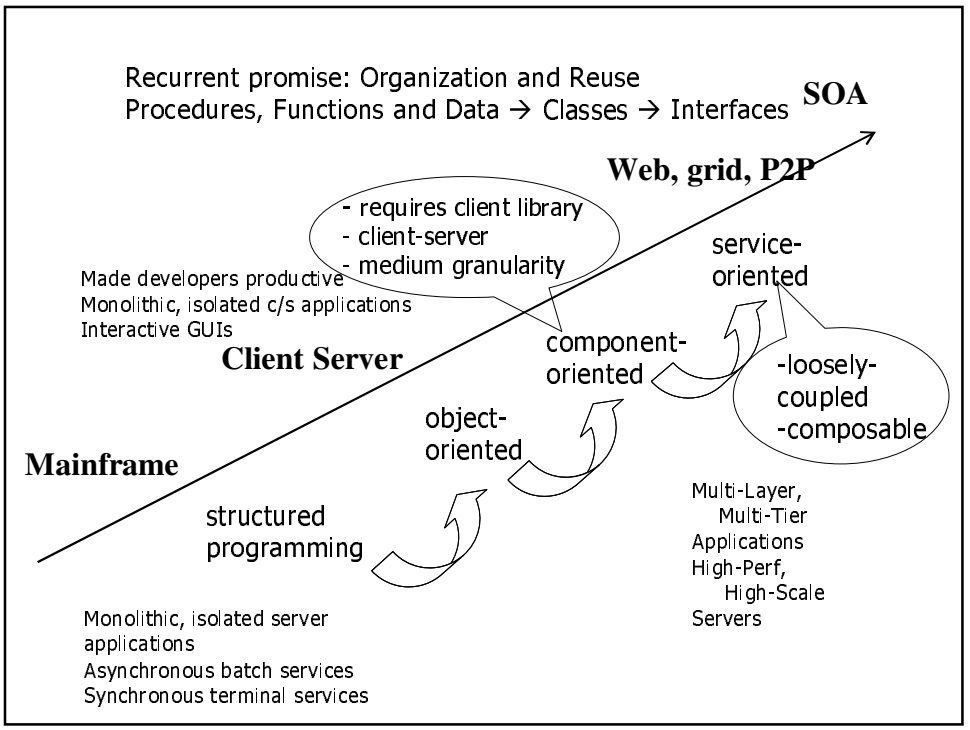

Palveluorientoitunut arkkitehtuuri
Service oriented architecture (SOA)
Service oriented computing (SOC)

Contents
Historiallinen sijoittuminen
Määritelmä
Käsitteitä
Infrastruktuuripalvelut
Lisäykset kurssikirjallisuuteen

Historiallinen sijoittuminen



Connectivity Drives the Emergence and Convergence of Technologies

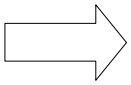


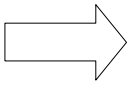
Paradigmojen ongelmia

- Structured programming, object-oriented, component-oriented paradigms
- Ohjelmointiparadigmoja
  - Ohjelmointikäsitteet hallitsevat arkkitehtuurin muotoutumista
- Abstrakteja käsitteitä, konkreettisia kuvauksia sovellusalustalle
- → C++, CORBA
- → Uudelleenkäyttö alusta/kieli/sovellusaluekohtaista
- Organisaatiorajojen ylittäminen vaikeaa
- Mallit pääosin synkronisia

Shift To A Service-Oriented Architecture

- Function oriented
- Build to last
- Prolonged development cycles
- Application silos
- Tightly coupled
- Object oriented
- Known implementation





- Coordination oriented
- Build to change
- Incrementally built and deployed
- Enterprise solutions
- Loosely coupled
- Message oriented
- Abstraction

Source: Microsoft (Modified)

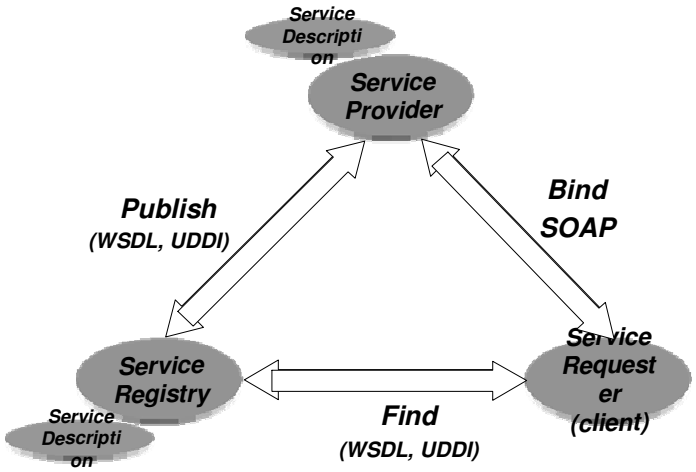
Palvelukeskeisyys

- Mikä on palvelu (service)?
- Toiminnallinen kokonaisuus, esimerkiksi
  - Viestin vastaanottaja eli sovellus
  - Viestinvälittäjä (infrastruktuuri)
  - Siirtoprotokolla (transport)
- Palvelun sijainti, sovellusalusta, ohjelmakoodi merkityksettömiä
- Palvelu ei vastaa
  - transaktiota, objektia, funktiota; servanttia
- Palvelu sinänsä ei ole synkroninen/asynkroninen, tilallinen/tilaton
- Perusoletukset
  - etäkäyttö
  - heterogeeniset alustat
  - palvelun sisäinen toteutusrakenne merkityksetöntä

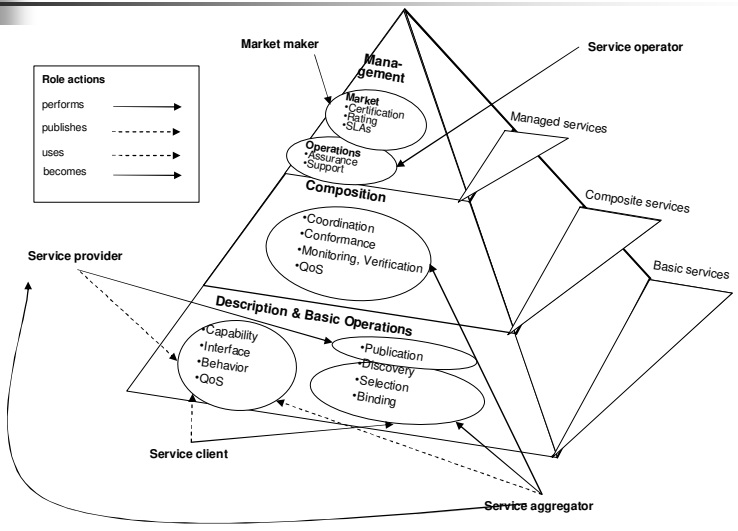
Definition

- Service-oriented computing is the new computing paradigm that utilizes services for developing applications.
- SOA foundation is in
  - basic services and their descriptions
  - publication, discovery and selection of services, and
  - binding of services
- Higher layers of SOA pyramid provide support for
  - service composition
  - service management

Service-oriented Architecture



Extended Service-oriented Architecture

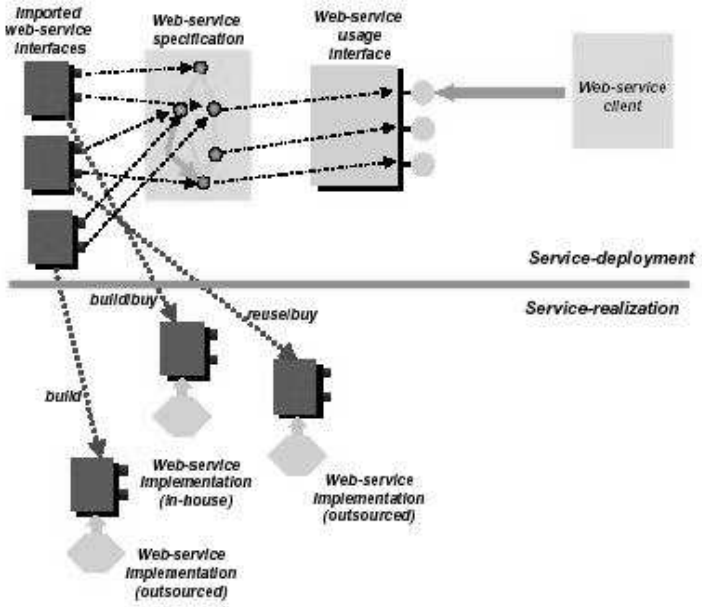


Overview of services

- services are self-describing, open components
  - support low-cost composition
- service providers
  - organisations that procure service implementations
  - provide service descriptions
  - provide runtime environment
- service descriptors advertise
  - service capabilities
  - interface (signature) + behaviour (workflow)
  - QoS, security, availability etc
- technology neutral, support location transparency

Description of basic operations

- SOA: architecture about services and relationships between service provider, service discovery agency, and service requestor
  - publish, find, bind
- separation of service implementation and service interface



Service composition layer

- loosely coupled services
- Coordination
  - control execution of component services
  - manage dataflow between them
- Conformance
  - interoperability testing, enforcement of business rules
- Monitoring, verification
  - subscribing to events or results of component services or composed service
- QoS
  - aggregation of QoS contracts from component service QoS

Service management layer

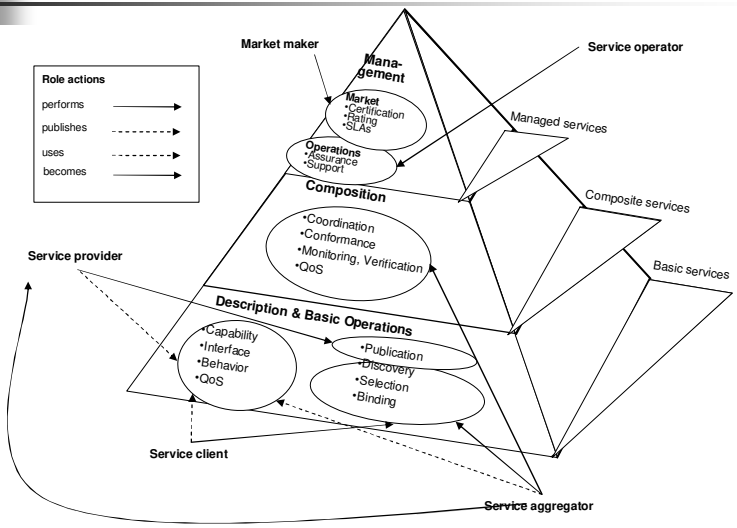
for service operator

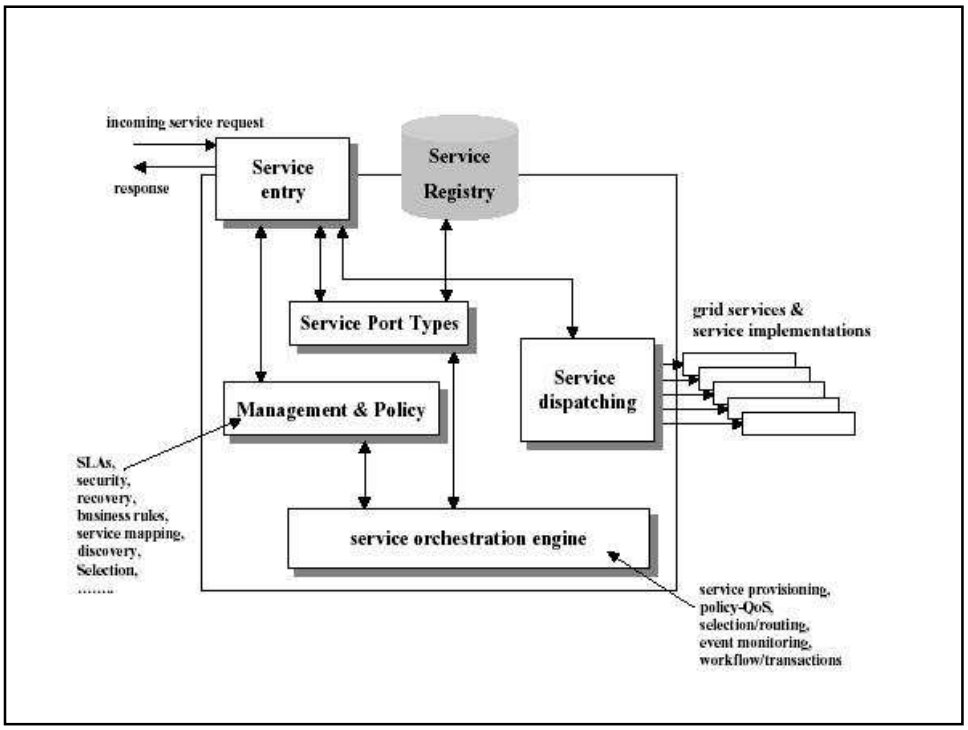
- management of service platform
- deployment of services/applications
- assesment of application performance

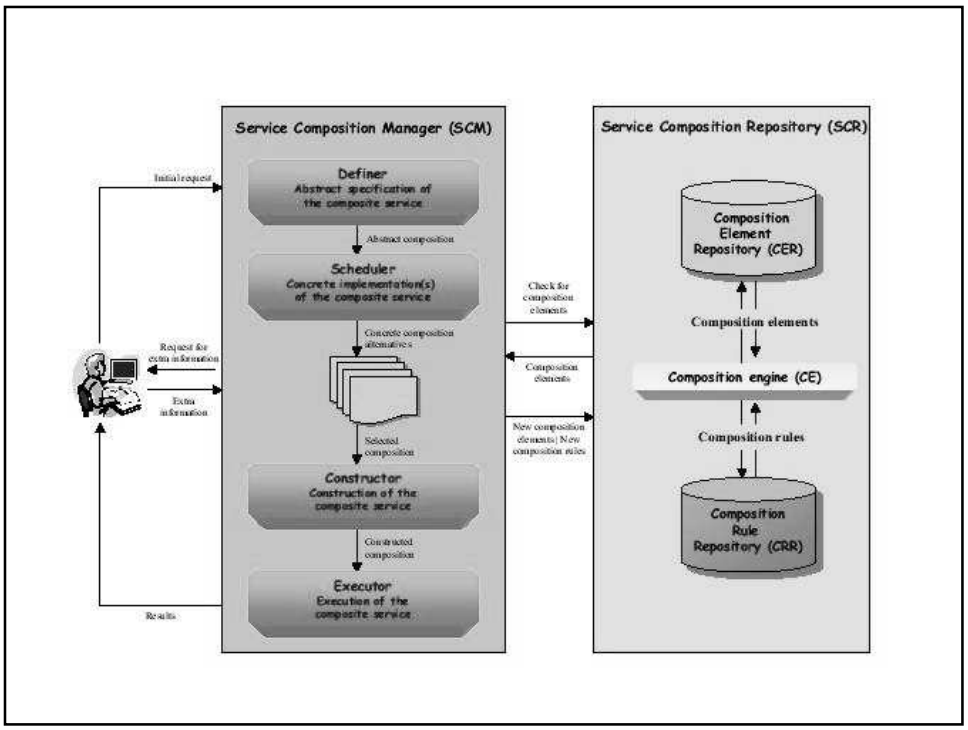
for open service market

- directories, domain specific business protocols
- view of products and services, business terminology, detailed business process descriptions
- negotiation of SLA (service level agreement)

Extended Service-oriented Architecture




incoming service request
response
Service entry
Service Registry
Service Port Types
grid services & service implementations
Service dispatching
Management & Policy
SLAs, security, recovery, business rules, service mapping, discovery, Selection, ...
service orchestration engine
service provisioning, policy-QoS, selection/routing, event monitoring, workflow/transactions


Service Composition Manager (SCM)
Service Composition Repository (SCR)
Initial request
Definer
Abstract specification of the composite service
Abstract composition
Scheduler
Concrete implementation(s) of the composite service
Concrete composition alternatives
Request for extra information
Extra information
Selected composition
Constructor
Construction of the composite service
Constructed composition
Executor
Execution of the composite service
Results
Check for composition elements
Composition elements
New composition elements| New composition rules
Composition Element Repository (CER)
Composition elements
Composition engine (CE)
Composition rules
Composition Rule Repository (CRR)

Lisäykset kurssilukemistoon

- Papazoglou, M.P. & Georgakopoulos, D.: Service-Oriented Computing. In Communications of the ACM, 46(10):25-28, October 2003.
- Papazoglou, M.P.: Service-Oriented Computing: Concepts, Characteristics and Directions. Keynote for the 4th International Conference on Web Information Systems Engineering (WISE 2003), December 10-12, 2003.
- Orriëns, B., Yang, J., Papazoglou, M.P.: Model driven service composition. To appear in Proceedings of the First International Conference on Service Oriented Computing, Trento, Italy, December 15-18, 2003.