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Towards the next generation of Internet Services: loosely coupled systems

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What's the Goal?

- To create an infrastructure to enable the creation of (globally?) distributed applications based upon the composition of Services (via internet protocols)

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Challenges ...

- The network:
  - bandwidth
  - latency
  - reliability
- Heterogeneity:
  - protocols
  - systems
  - data
  - ...
- Security
- Implementation Evolution
- ...

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How?

- Interoperation of:
  - network transport protocols (we've got that)
  - service discovery mechanism(s) (tbd)
    - UDDI, ebXML Reg/Rep,...
  - service description/definition (tbd):
    - UML, tpaML, ...
  - domain/services protocols (tbd):
    - SOAP, ebXML TP&R, XML schemas, ...
  - data representation (tbd):
    - XML, ...
  - …
- XML can be used (as part thereof) of the solution to the TBDs above

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Why use XML?

- It's cool! (seriously)
- Can can be used to describe a staggering variety of (distinguished, composite) structured data
- it can itself be described (schemas) and verified
- it can be easily transformed (isomorphic properties)
- ...

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What is Loose Coupling and Why is it important?

- Definition:
  - An abstract service or function definition; that is the syntax and semantics of the service or function as described to consumers via an some contract is completely independent of (any or all) concrete implementations thereof.
- Why is Loose Coupling important:
  - Internet Service(s) must be loosely coupled to enable service implementors to evolve their implementations without requiring their (many) consumers to also evolve theirs synchronously!
- Using XML to describe Services creates the opportunity to loosely couple Services

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Is'nt this just Object Encapsulation?

- Basically yes …. But
- The devil is in the details!
  - How many OO systems actually make it hard NOT to blur the distinction between interface (abstraction) and implementation?
  - How many OO developers actually practice this?
- The evidence to support this …
  - look at the history of client server computing?
- Will we succeed this time?
  - Beats the hell out of me?

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What is ebXML?

- A consortium led by UN/CEFACT & OASIS
- a layered set of specifications describing a framework and methodology for enabling e-commerce via communications between Internet Services:
  - Registry/Repository
  - Business/Process (meta) model
  - Business Core Components (schema fragments)
  - Trading Partner Agreements
  - Transport, Packaging & Routing

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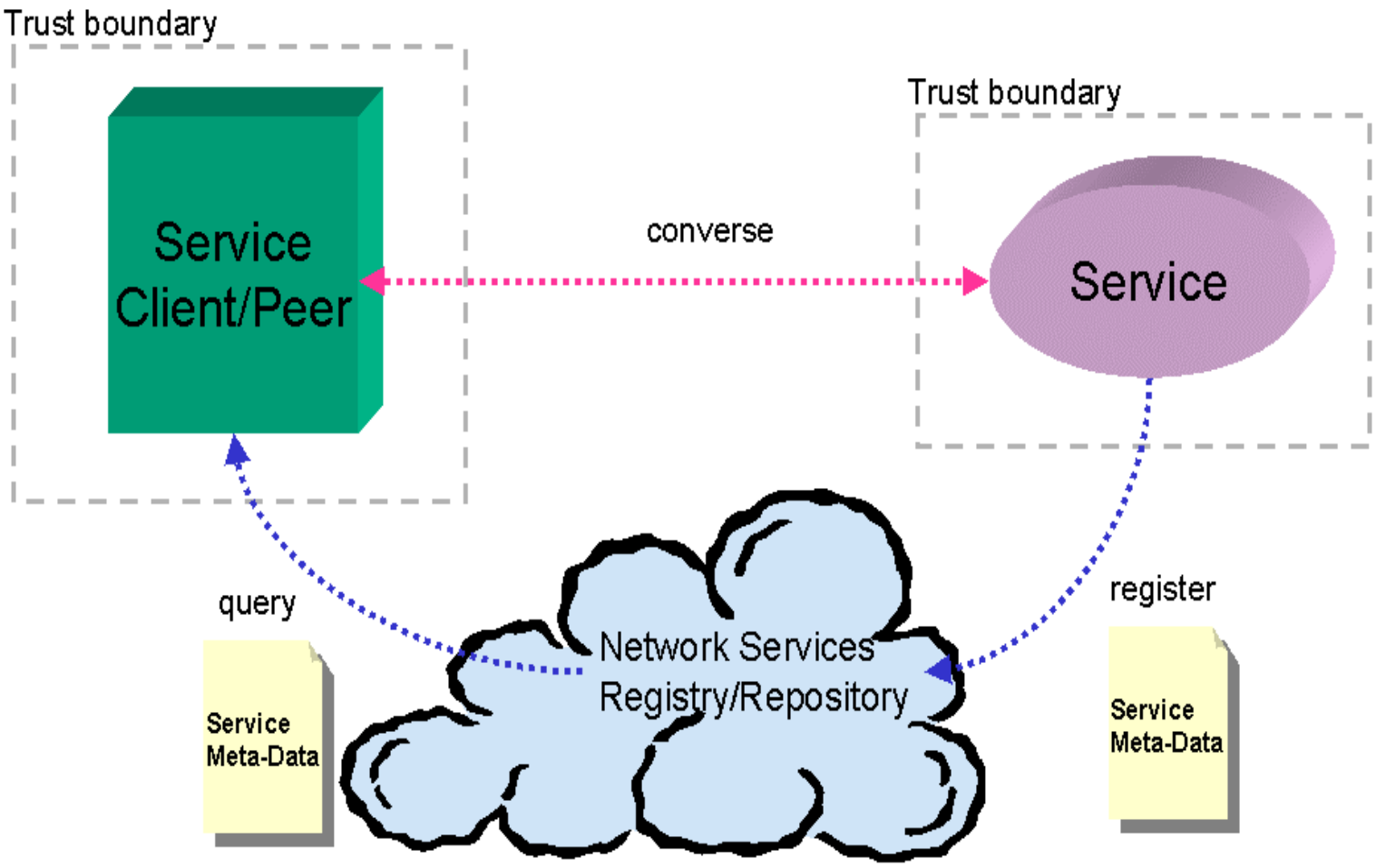
Internet Services Model



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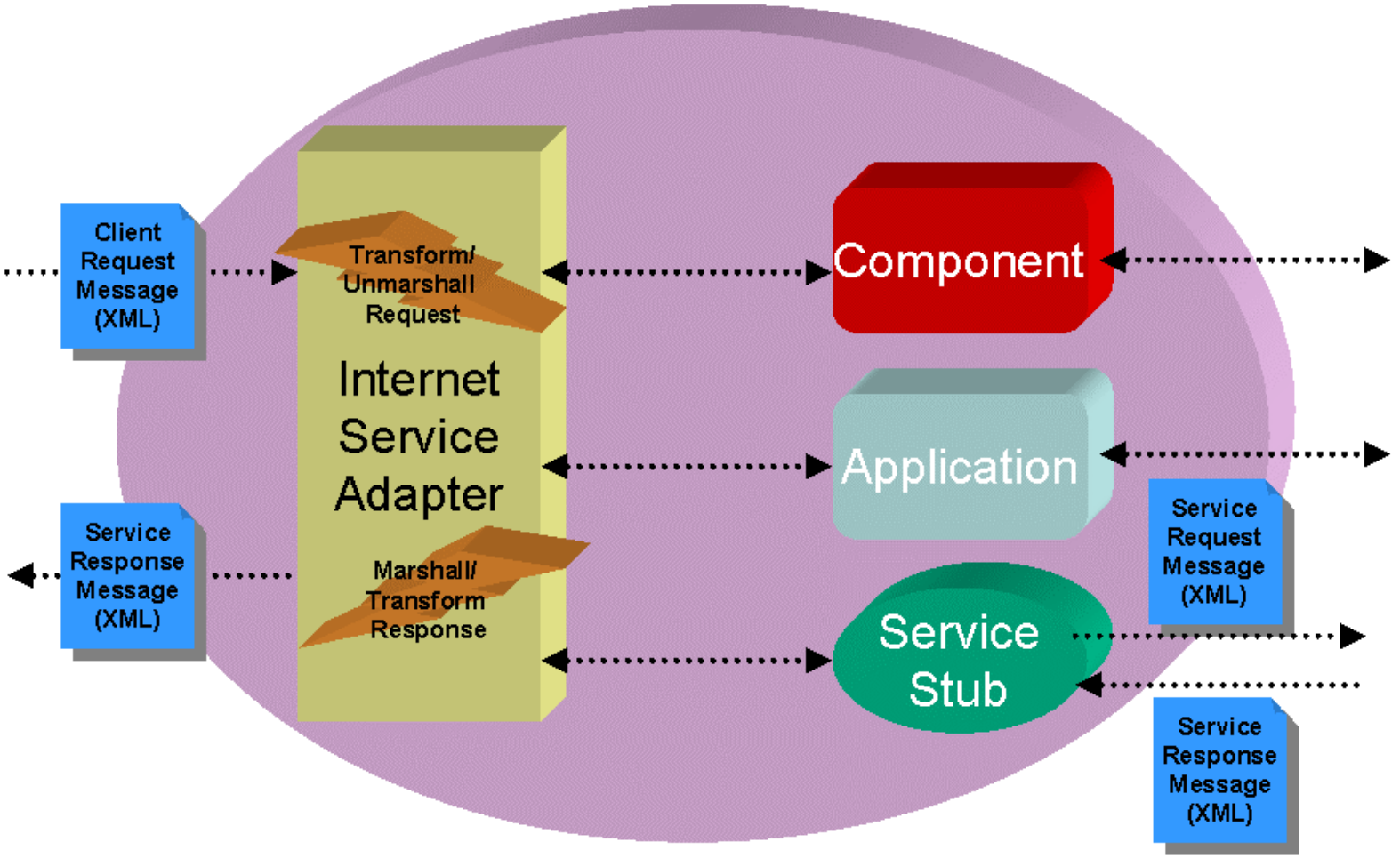
Internet Services Implementation Model



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ebXML Service is described by:

- The following registered in the Repository:
  - A meta model of the “process”
  - A Trading Partner Agreement (service) describing:
    - overall properties/description
    - network transport(s)
    - network and service security characteristics
    - participant roles
    - service actions
    - service errors
    - service message sequencing/workflow
    - ...
  - message schemata

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SOAP Vs ebXML TP&R “at a glance”

- SOAP:
  - formats:
    - XML envelope
    - XML headers
    - XML payload
  - has (optional) RPC semantics and binding to HTTP
  - has defined payload serialization format/type system
  - headers have no identity/routing/security info defined (yet)
  - ...
- ebXML: TP&R:
  - formats:
    - MIME envelope
    - XML headers
    - arbitrary payload
  - has no protocol binding(s) specified (so far)
  - has/assumes no defined payload serialization format
  - headers have defined identity/routing/security information
  - ...

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Don’t Worry!

- There are plenty of organizations working in this space:
  - W3C
  - OASIS
  - ebXML
  - RosettaNet
  - OBI
  - Biztalk
  - UN/CEFACT
  - ASC X12
  - Ariba, CommerceOne, …
  - IETF
  - ...

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Conclusions

- Enabling (globally accessible) Internet Services is “the next big thing”:
  - we have to do this …
- Interoperability is key (read stds)
- Loose coupling is fundamental
- Both SOAP, UDDI, and ebXML have roles to play ...
- The similarities between the technologies are subtle, but maybe significant
- There is no clear winner (yet)