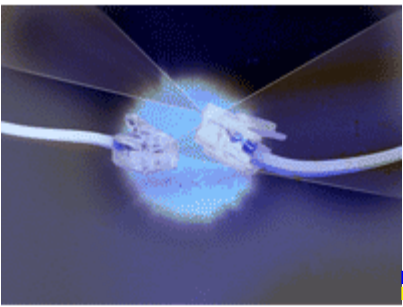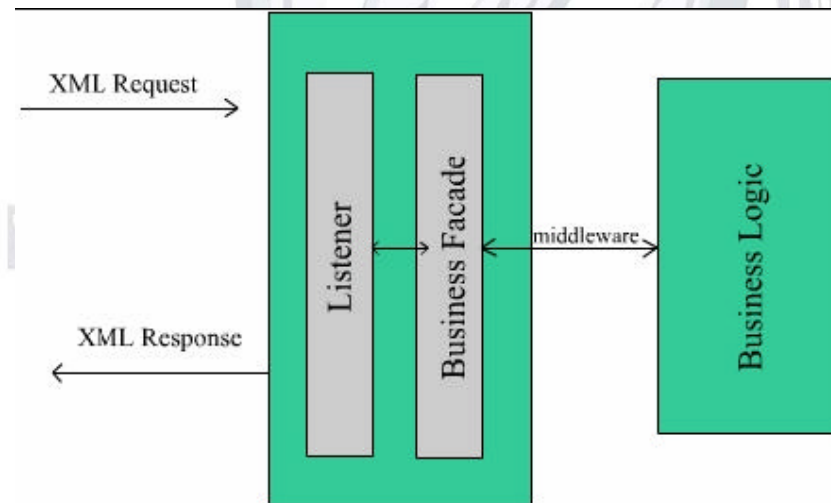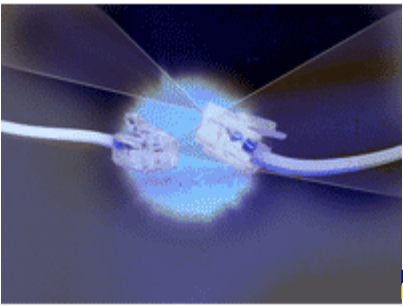# Web Services

- Distributed computing framework
  - Similar to CORBA or EJBs
  - Designed to make software components available for remote execution

- Features (from IBM tutorial):
  - Self-contained, self-describing, modular
  - Published, located, and invoked across the Web
  - Functions range from simple requests to complicated business processes

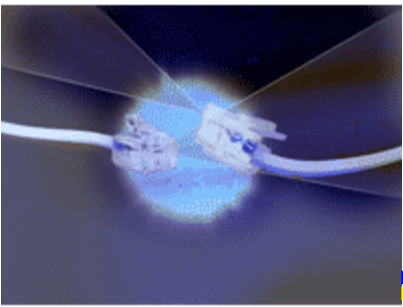# Advantages of Web Services

- Web Services advantages over CORBA, RMI, etc.
  - Based on standard Web technologies
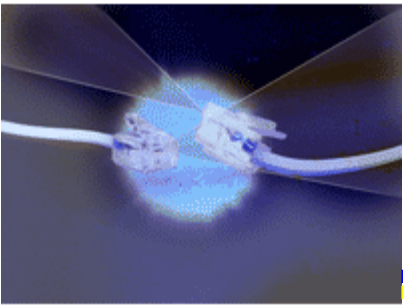 - Provide simple, easy to access interface

Web Services Foundations

- Basic platform is XML and HTTP

- Additional layers to actually provide RPC functionality
  - SOAP (Simple Object Access Protocol)
  - WSDL (Web Services Definition Language)
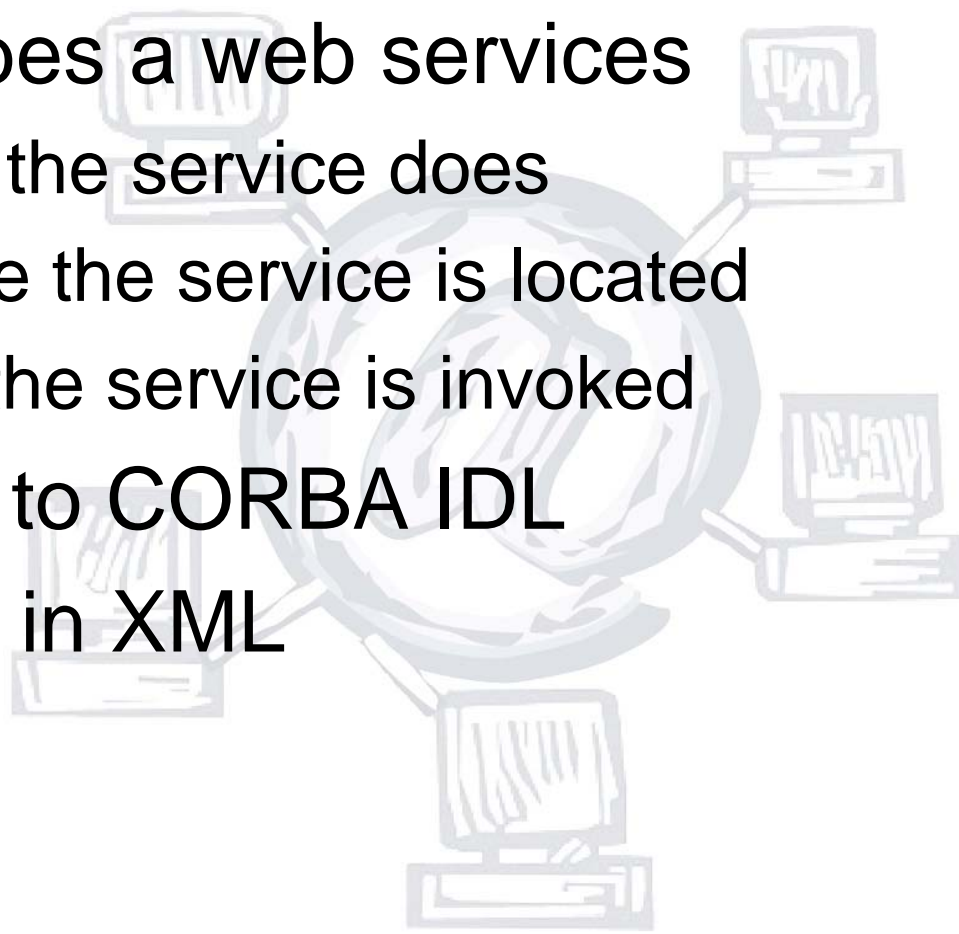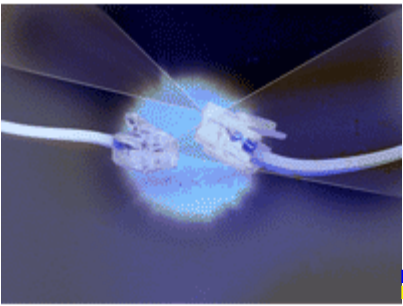 - UDDI (Universal Description, Discovery, and Integration Service)

SOAP

- Protocol for passing XML-encoded data
- Defines mechanism for performing remote procedure calls using HTTP
  - HTTP is everywhere, and is easy to access over WAN
  - XML is very interoperable, easy to debug
- Overseen by W2C's XML Protocols Working Group
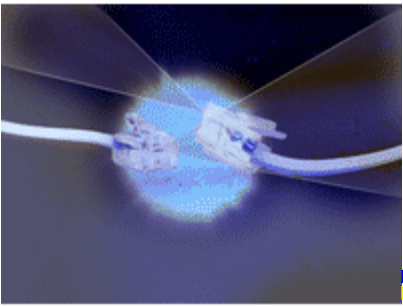
WSDL

- Describes a web services
  - What the service does
  - Where the service is located
  - How the service is invoked
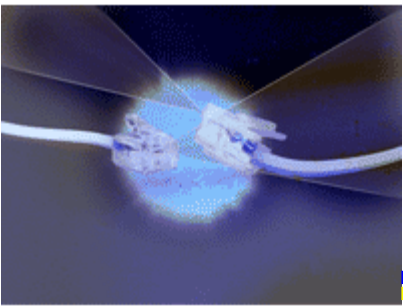- Similar to CORBA IDL
- Written in XML

WSDL (cont.)

- Elements
  - Types (typically XML Schema types – XSD)
  - Message – typed definition of data exchanged
  - Operation – description of action provided
  - Port Type – set of operations supported by one or more endpoints
  - Binding – protocol and data format specification for port type
  - Port – single endpoint (binding + address)
  - Service – collection of related endpoints

UDDI

- Mechanism to dynamically find web services
  - Similar to DNS server or CORBA trader
- Layered over SOAP
  - Use SOAP to access UDDI services
  - Everything is XML and HTTP

UDDI Services

- White Pages
  - **Publish** operation to allow Web service to register itself

- Yellow Pages
  - **Find** operation to look up particular service

- Green Pages
  - **Bind** operation to describe how client app connects to service