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ANSA Phase III

Integrating CORBA with the Web

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Abstract

This presentation has been prepared for the September 1995 visit to Fujitsu Labs. It provides an overview of the ANSAweb task which aims to integrate CORBA with the Web.

This presentation begins by introducing ANSA's vision of a uniform information space based on integrated CORBA and Web technologies. It then describes the two phases of the ANSAweb task which work towards this vision. ANSAweb Phase 1 has developed an IDL-to-CGI stub compiler which can be used to wrap Web services in CORBA IDL. ANSAweb Phase 2 is engineering the CORBA IOP protocol into the Web as an alternative protocol to HTTP.

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ANSAweb: Integrating CORBA with the Web

Presentation to Fujitsu Labs, September 1995

Ashley McClenaghan

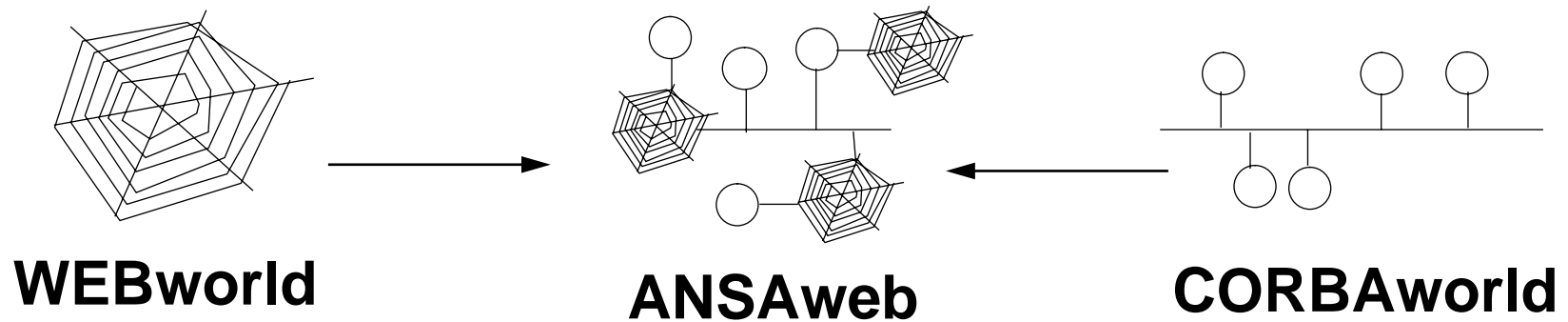
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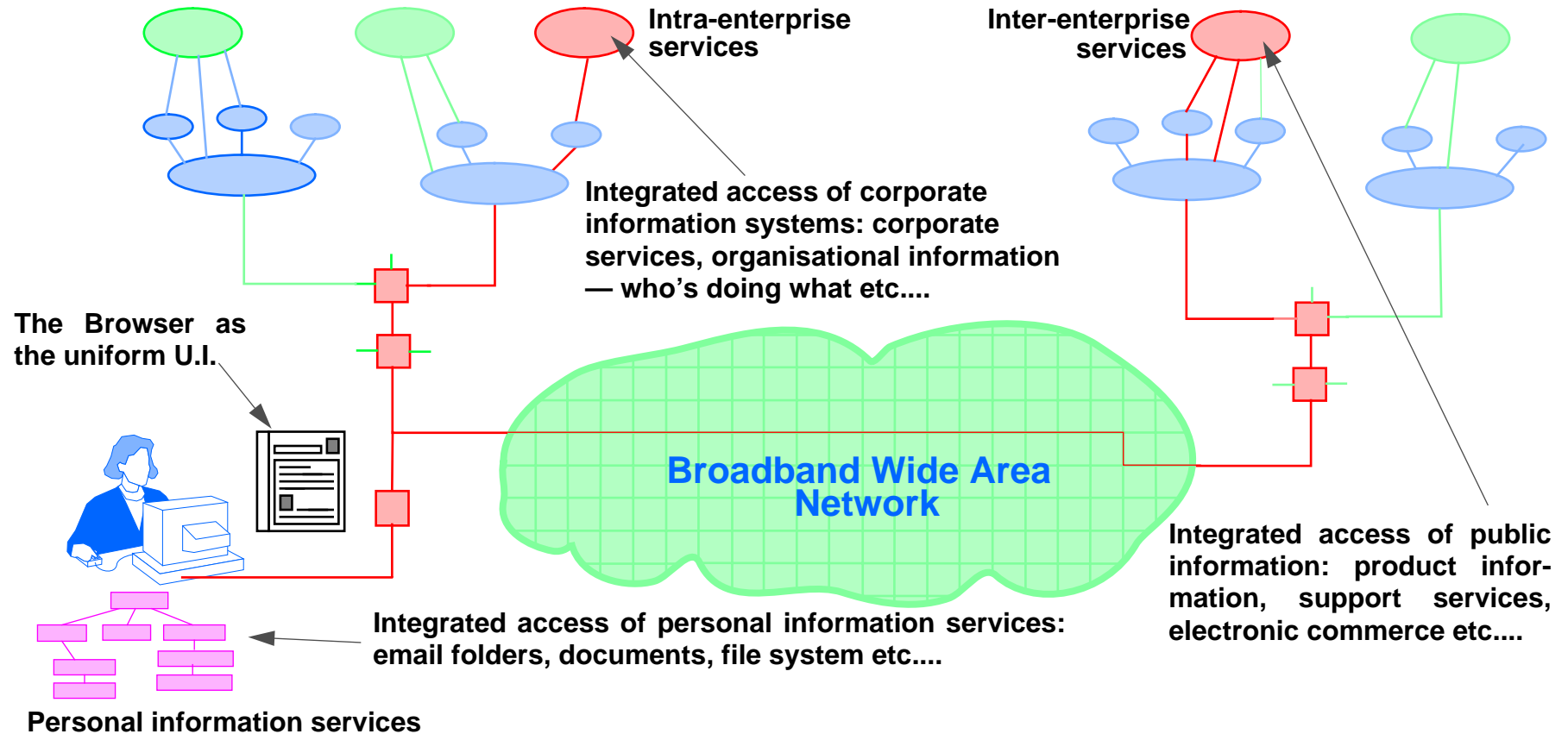
- **The ANSA vision: integrating CORBA with the Web**
- **ANSAweb Phase 1**
 - **Wrapping CGI services using IDL**
- **ANSAweb Phase 2**
 - **Introducing the IIOP protocol**
 - **Migrating Web browsers and servers to CORBA technology**

Integrating CORBA with the Web



- **General aim:**
 - **Create a uniform information space by enabling interworking between the Web world and the CORBA world**

Creating a Uniform Information Space





CORBA and Web Integration

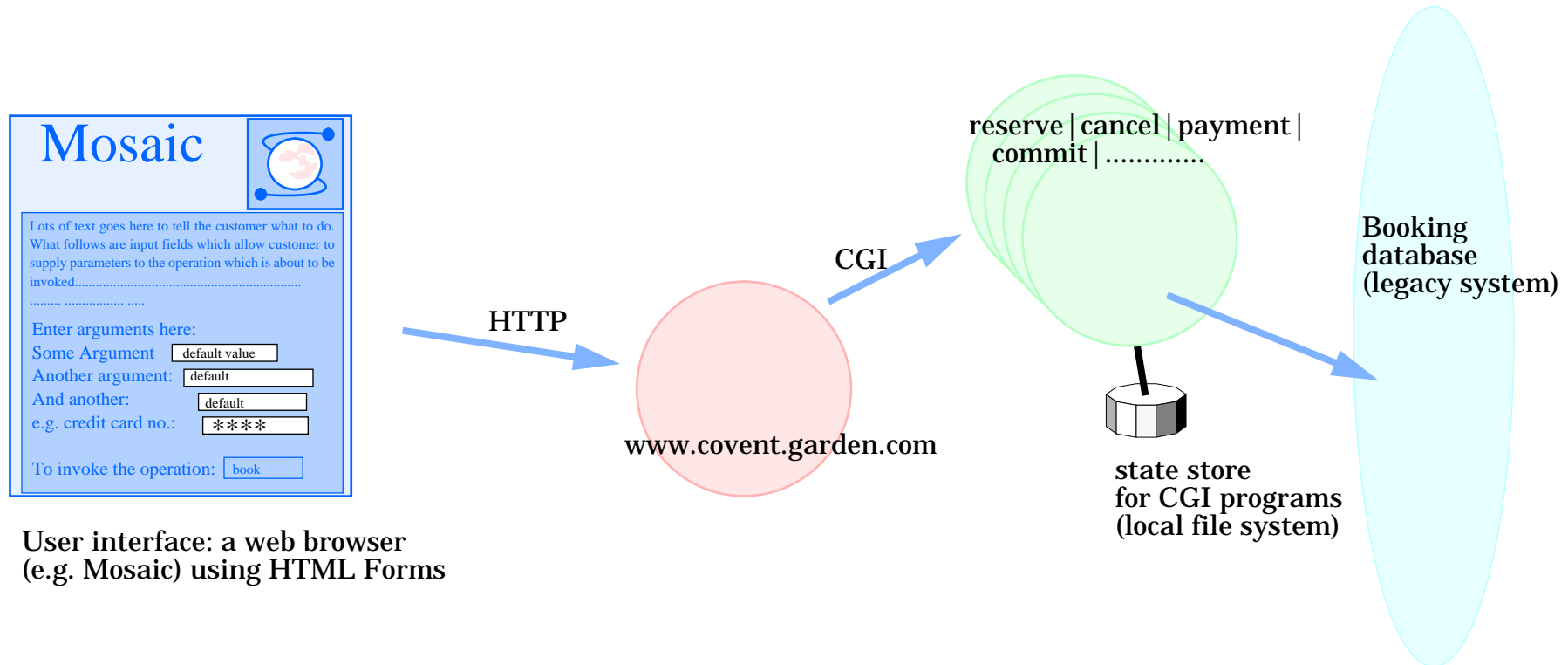
- **Web world**
 - **Scope: information access on global scale**
 - **Benefits: ubiquitous, user-friendly**
- **CORBA world**
 - **Scope: systems integration on corporate scale**
 - **Benefits: good object oriented model, supports heterogeneity, faster protocols, scalable, program oriented interfaces**
- **Other integration projects**
 - **Web* (Web pages containing Tcl scripts can invoke Orbix based servers)**
 - **OSF DCE-Web (inserts a DCE infrastructure layer under the Web)**



The ANSAweb Task

- **Phase 1**
 - **Aim: wrap CGI servers in CORBA IDL**
 - **Status: public release (June 9, 1995)**
 - **Code: developed IDL-to-CGI Stub Compiler**
- **Phase 2**
 - **Aims: introduce CORBA IIOP as an alternative protocol to HTTP wrap Web (document) servers in CORBA IDL integrate third party services, such as Locators, as CORBA services**
 - **To be announced at the 4th Web Conference (December 1995)**

Extending the functionality of Web using CGI Programs



User interface: a web browser (e.g. Mosaic) using HTML Forms

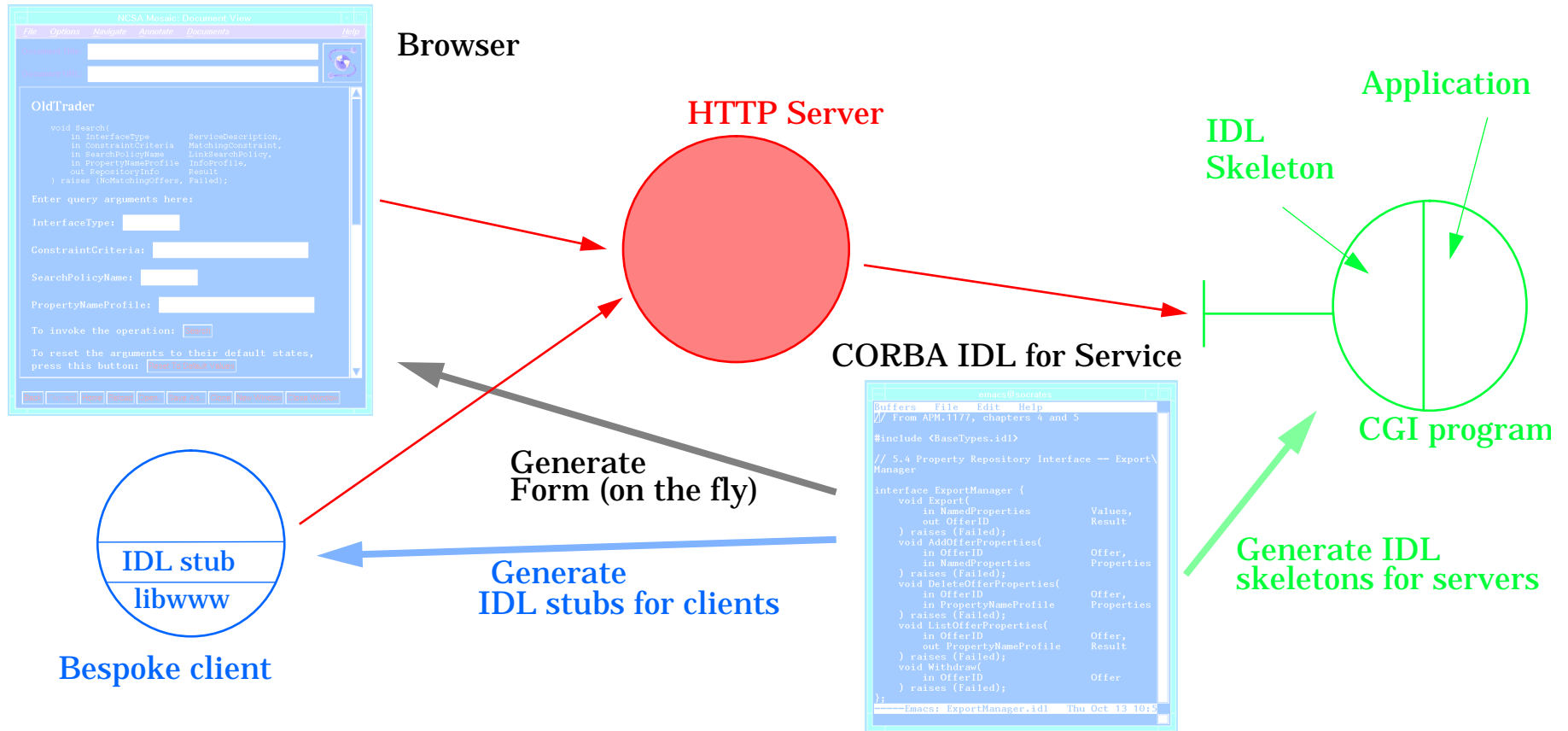


CGI Programming

- **Purpose:**
 - Allows developers to extend the functionality of the Web by adding new services using the CGI (Common Gateway Interface)
- **Disadvantages:**
 - Difficult (error prone) to write code to unmarshal parameters to CGI programs (no tool support)
 - Time consuming to make the CGI server-side interface consistent with the corresponding HTML form client-side interface
- **Solution:**
 - ANSAweb Phase 1 overcomes these disadvantages



The ANSAweb IDL-to-CGI Stub Compiler





The Key Idea

- Access services through CORBA IDL interfaces
- The compiler takes an IDL interface specification then automatically generates:
 - server-side CGI stubs (“skeletons”)
 - client-side program-oriented stubs
 - client-side HTML forms

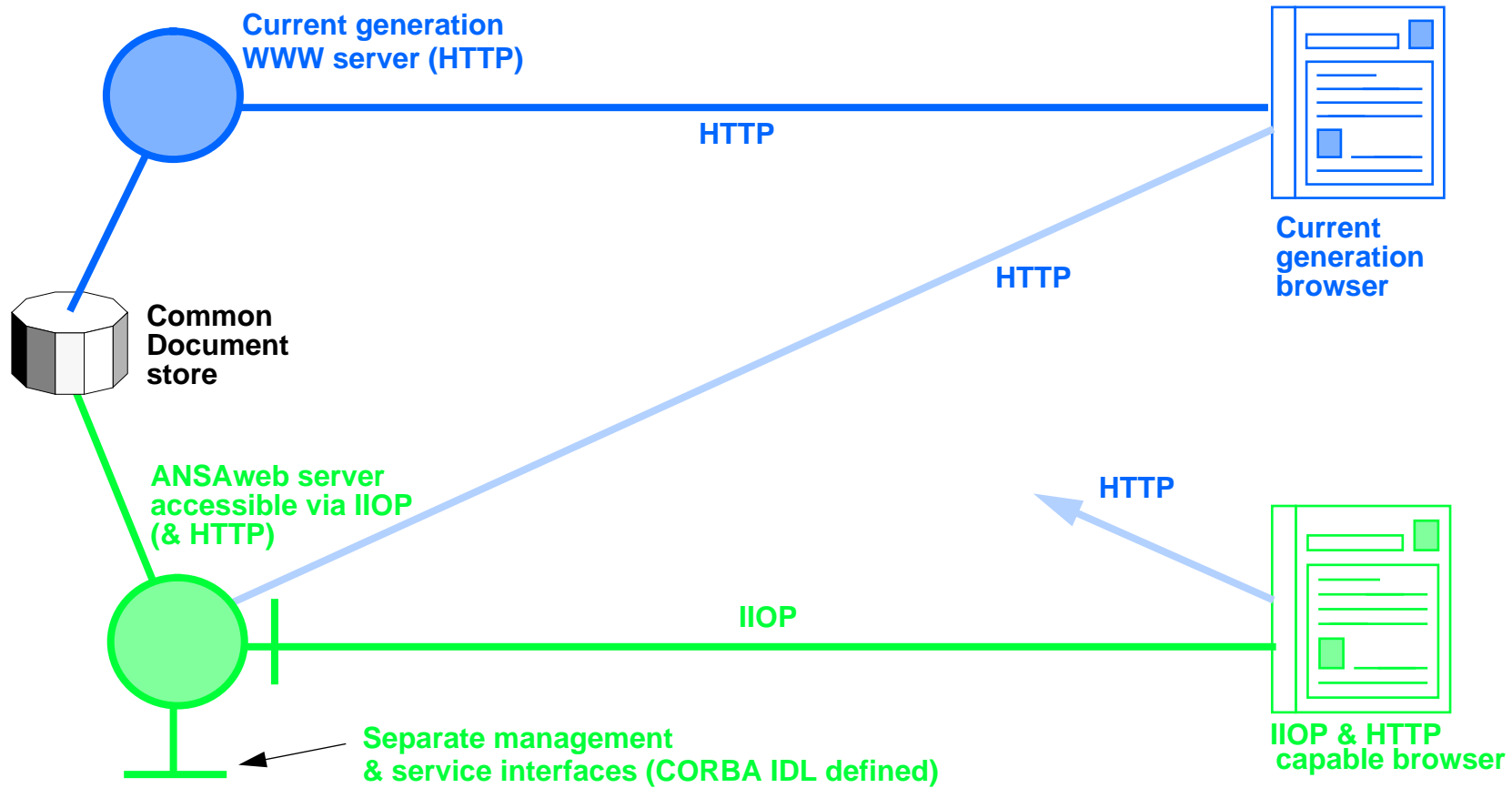


Benefits of Phase 1

- **Less code to write!**
- **Productivity**
 - Use of the CORBA IDL standard makes it easy to interface systems with the Web
 - The compiler provides abstraction --- the programmers do not require a deep understanding of the underlying platforms and protocols
- **Fewer errors**
 - Template forms are correct HTML
 - Template forms, stubs and skeletons are consistent
- **Protection against changes**
 - Skeletons and stubs abstract the programmer from underlying platform: if the platform or protocol changes then change the stub compiler and regenerate the stubs, you do not have to rewrite the application



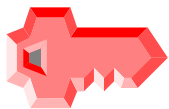
ANSAweb Phase 2: Migrating the Web to Distributed Objects





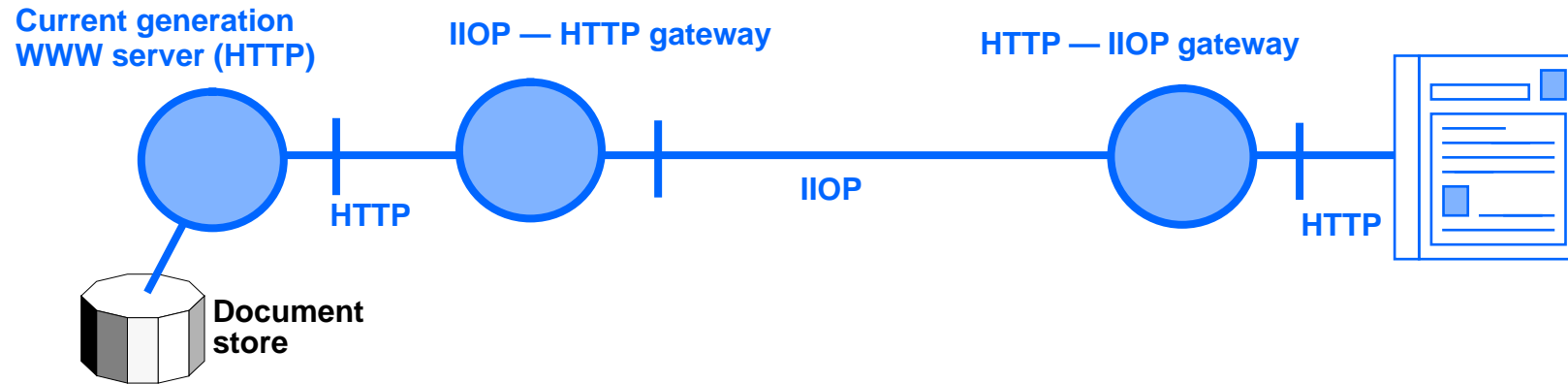
Benefits of Phase 2

- **Extensibility**
 - The ANSAweb server is a CORBA server object
 - The ANSAweb IDL-to-CGI provides a gateway to the CORBA world
 - Interfaces defined and extensible in IDL
 - Integrating third party systems is simpler
- **Scalable**
 - Build clients and servers from modular CORBA object technology
- **Build CORBA-based management facilities**
- **Performance and capabilities of IIOP**
 - Binary encoding and better connection management



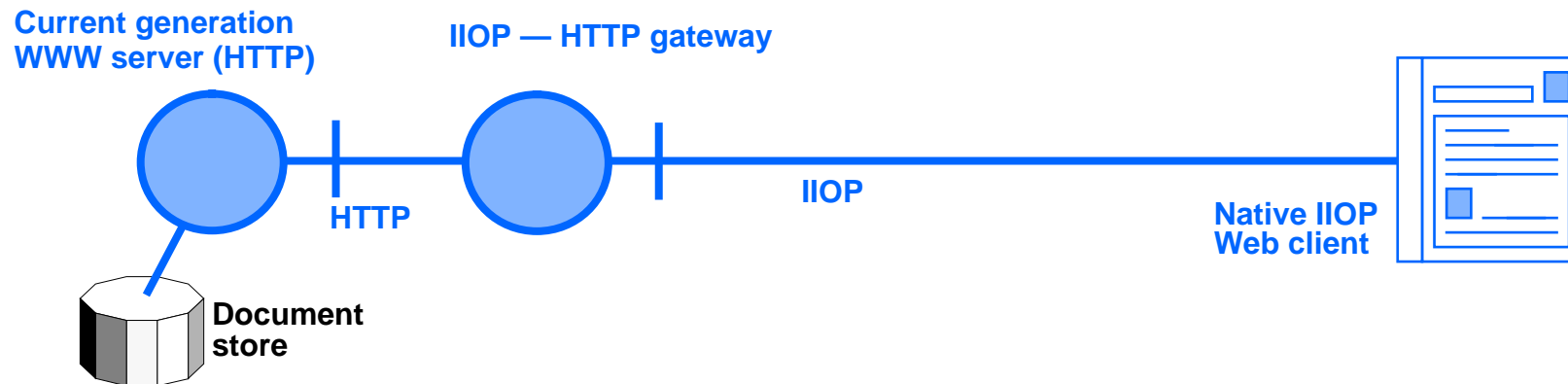
Backwards compatibility: all existing Web functionality and resource investment is preserved

The Intermediate Step: Use Gateways



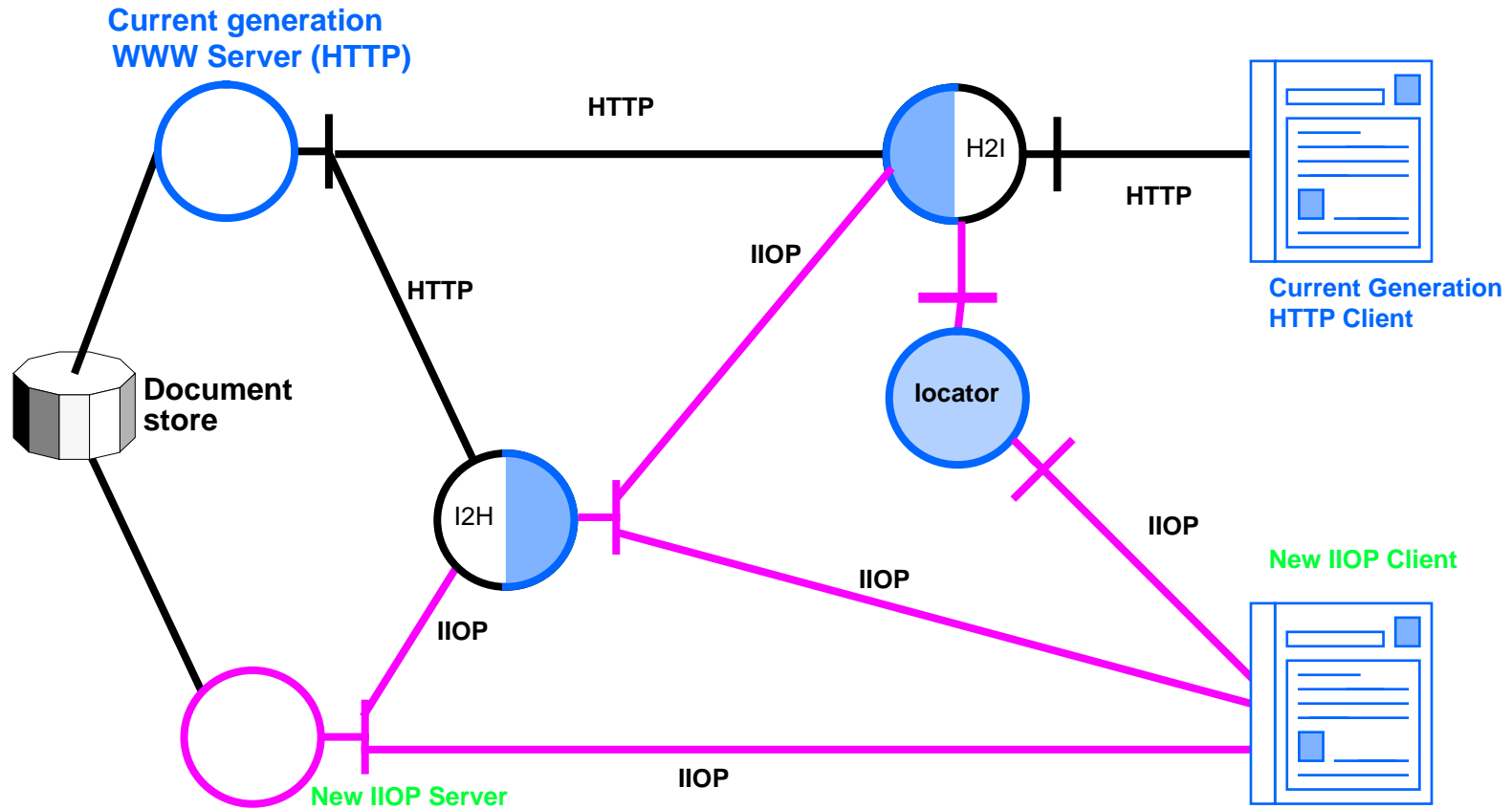
- The I2H and H2I gateway combination behaves like a proxy
- Initial versions of these intermediate components are working

The Next Step: Native IIOP Technology



- **Building Web clients that can talk IIOP**

Native IIOP and Locator Technology





Status of Native IIOP Components

- **Built using different technologies:**
 - Sun's Inter-Orb Engine
 - Iona's Orbix
- **Initial versions of the native IIOP clients are working:**
 - Line Mode Browser (Common Code Library test client)
 - Arena (W3C's HTML-3 test-bed graphical client)
- **Other clients can easily be modified to use ANSAweb components**
 - Main problem is profusion of Web Library (libwww) versions
- **The basic Locator is in place**
 - This will ultimately be complemented by a fully capable ANSA Trader



Conclusions (1)

- **Aim:**
 - Integrate CORBA with the Web to create a uniform information space
- **Principle:**
 - The ANSA and CORBA distributed objects approach offers a long term solution to Web development: scalable and managable
- **Status:**
 - ANSAweb Phase 1 released June 9,1995
 - ANSAweb Phase 2 to be announced in December 1995 at the 4th International Web conference



Conclusions (2)

- **Benefits:**
 - The IDL-to-CGI Stub Compiler increases programmer productivity and reduces programmer errors
 - The IIOP Protocol produces better performance
 - CORBA IDL Interfaces provides abstraction from the underlying platforms and protocols
 - The ANSA and CORBA distributed object architecture offers a long term future to Web development and service integration



Documents

- **APM.1526 “A Web of Distributed Objects” (to be presented at the 4th Web Conference, December 1995)**
- **APM.1464 “Object Wrapping (for WWW) -- The Key to Integrated Services?”**
- **APM.1505 “Requirements for Re-Engineering the Web”**
- **APM.1510 “Design for Re-Engineering the Web”**
- **APM.1465 “A Stub Compiler for CGI and HTTP: The Programmer’s Guide”**