



**Poseidon House
Castle Park
Cambridge CB3 0RD
United Kingdom**

TELEPHONE:
INTERNATIONAL:
FAX:
E-MAIL:

**Cambridge (01223) 515010
+44 1223 515010
+44 1223 359779
apm@ansa.co.uk**

ANSA Phase III

ANSAweb: A Web of Distributed Objects

Owen Rees

Abstract

This is a presentation for ANSAworks '96 of the work described in the paper "A Web of Distributed Objects" that was presented at the Fourth International World Wide Web Conference.

The paper describes work on interoperability between the World Wide Web and Distributed Object systems that was carried out under the ANSA workprogramme, using the Object Management Group's CORBA architecture. The approach it describes offers the opportunity to bring the benefits of distributed object technology to the Web by using the CORBA infrastructure. This also offers a way to solve the current engineering problems by using available industry standard technology.

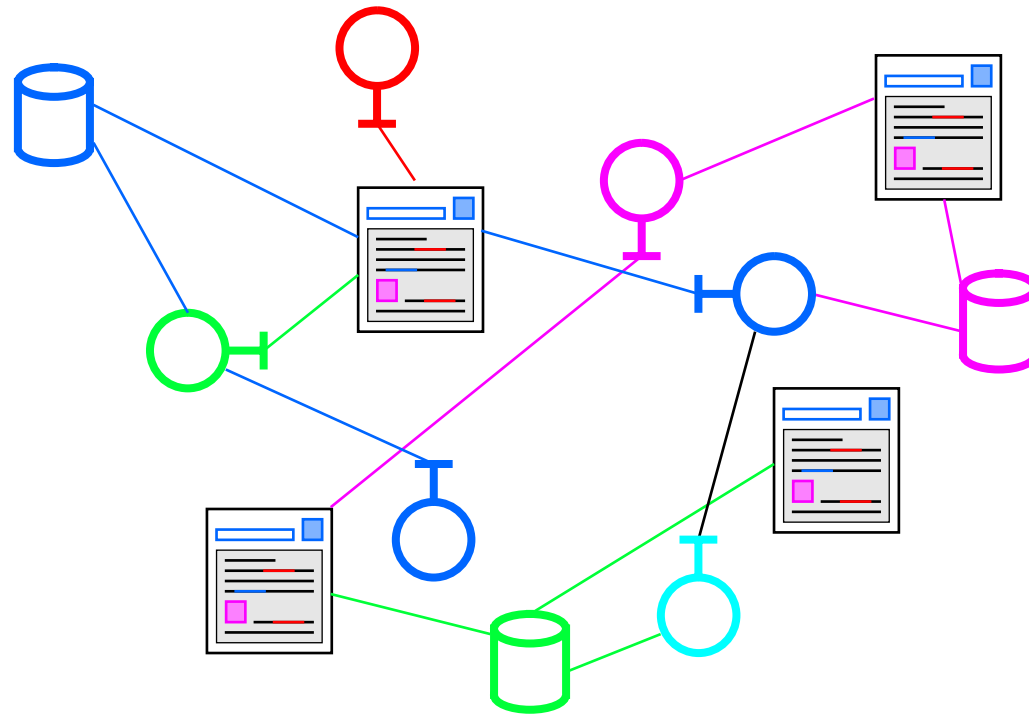
APM.1763.01

Approved
External Paper

23rd April 1996

Distribution:
Supersedes:
Superseded by:

ANSAweb



A Web of Distributed Objects



What did we do

- **The idea**
 - Seamless interoperability between CORBA and WWW
 - CORBA objects made to look like WWW resources
 - WWW resources made to look like CORBA objects
 - CORBA IDL representation of HTTP
 - Methods as operations, headers as parameters
 - Many possible mappings can coexist
 - Use IIOP — Internet Inter-ORB Protocol — standardised by OMG
- **The implementation**
 - Gateways
 - H2I — HTTP to IIOP
 - I2H — IIOP to HTTP
 - Translate the invocations
 - Interoperability rather than just tunnelling



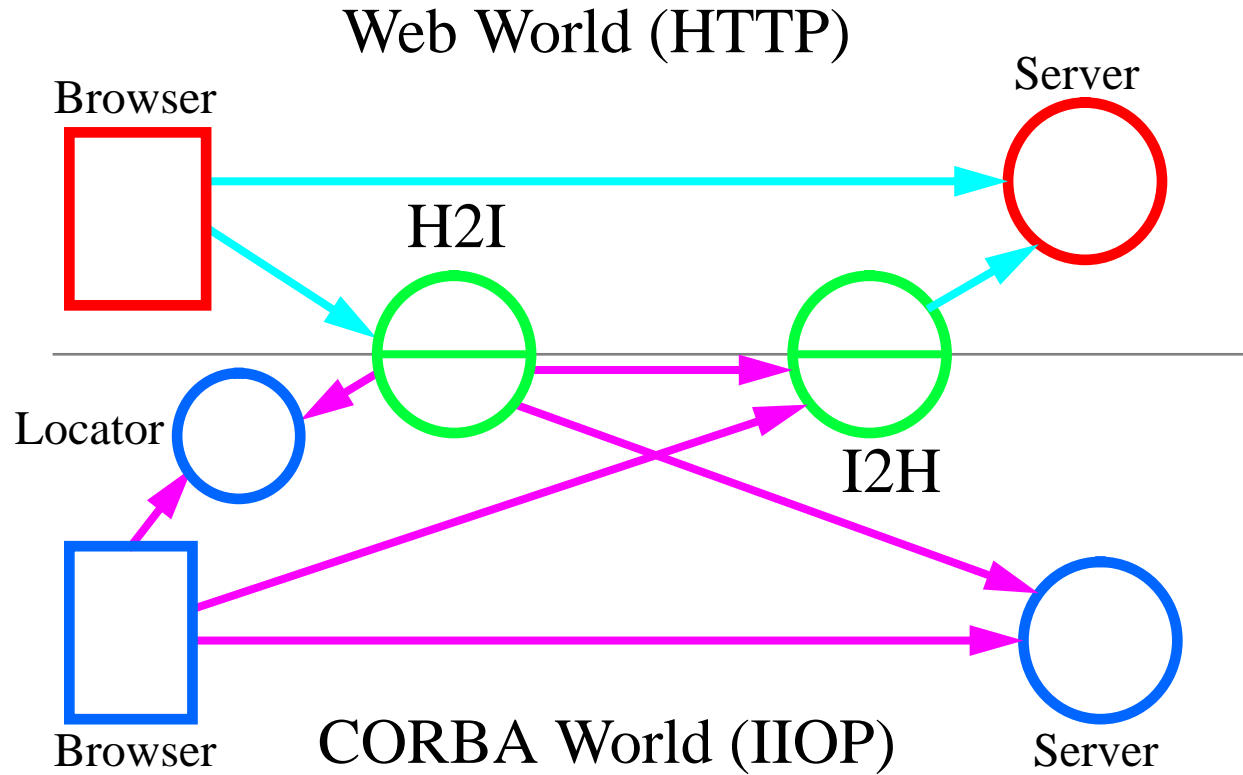
Why did we do it

- **Make CORBA technology accessible to the web**
- **Make Web technology and resources accessible to CORBA**
- **Examples of use**
 - **HTTP-IIOP-HTTP tunnelling with dynamic URL translation**
 - **Alternative to CGI — invoke an object via ORB**
 - **Web browser as UI for CORBA system**

Without losing the use of the old resources



The Web and CORBA Worlds Joined

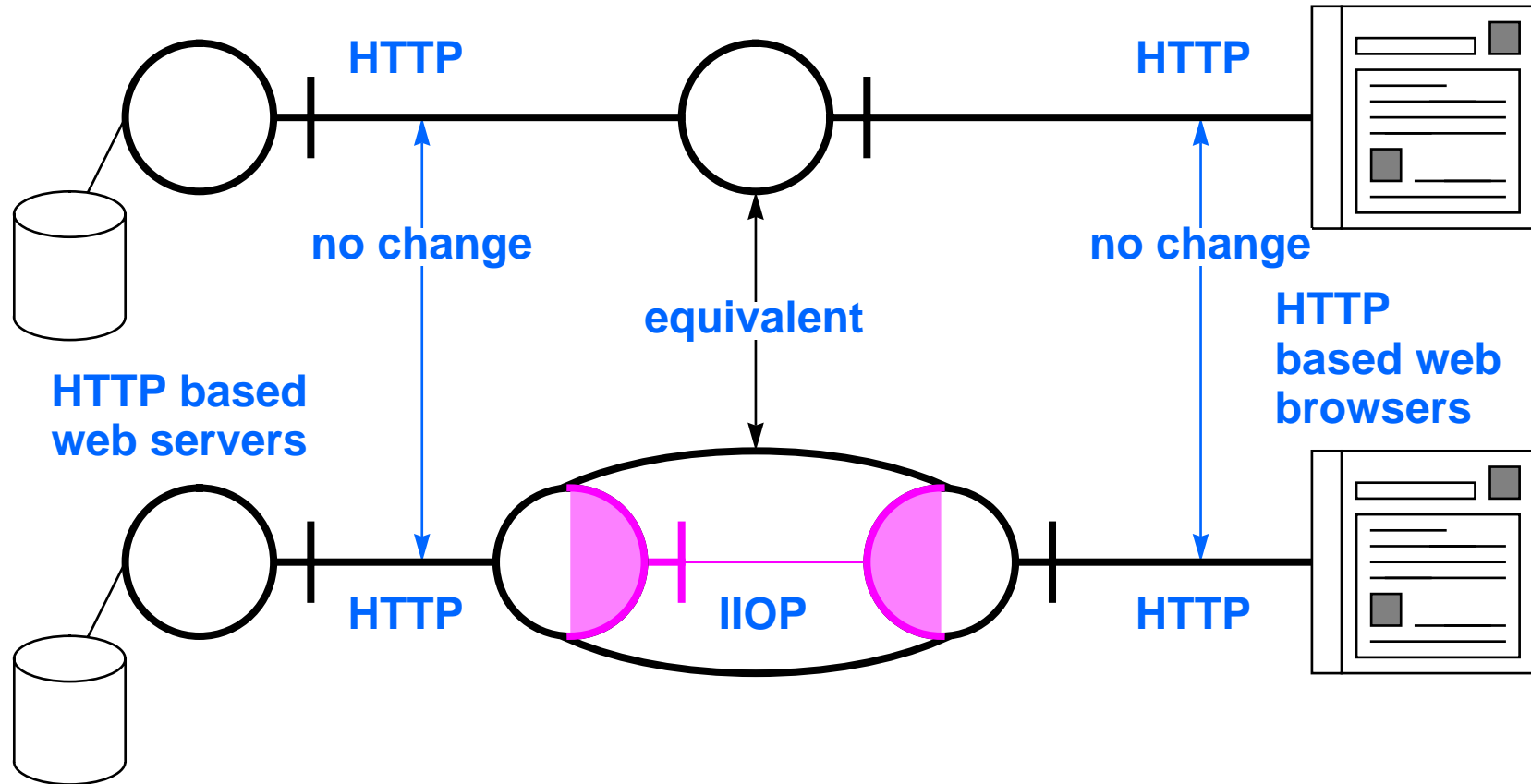


What We Did: Overview

- Gateways
 - H2I: takes HTTP to IIOp, used like a proxy
 - I2H: takes IIOp to HTTP
- Locator
 - Finds IIOp paths for H2I or other client
 - H2I can fall back to HTTP
- Invocation translations
 - Not just tunnelling
 - Full interoperability

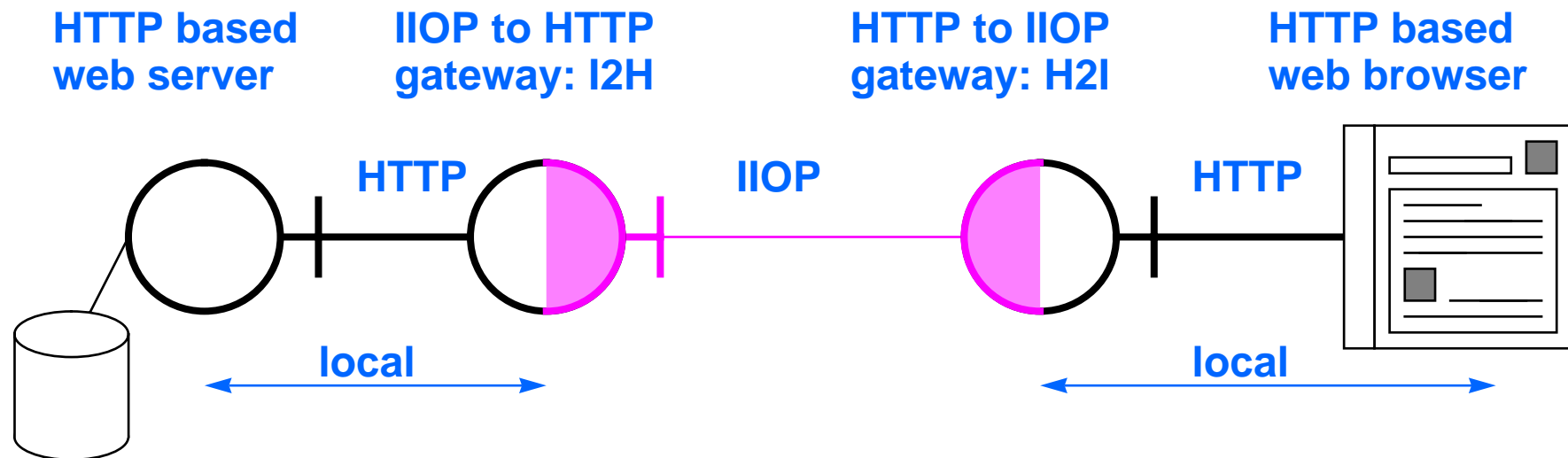


Gateways



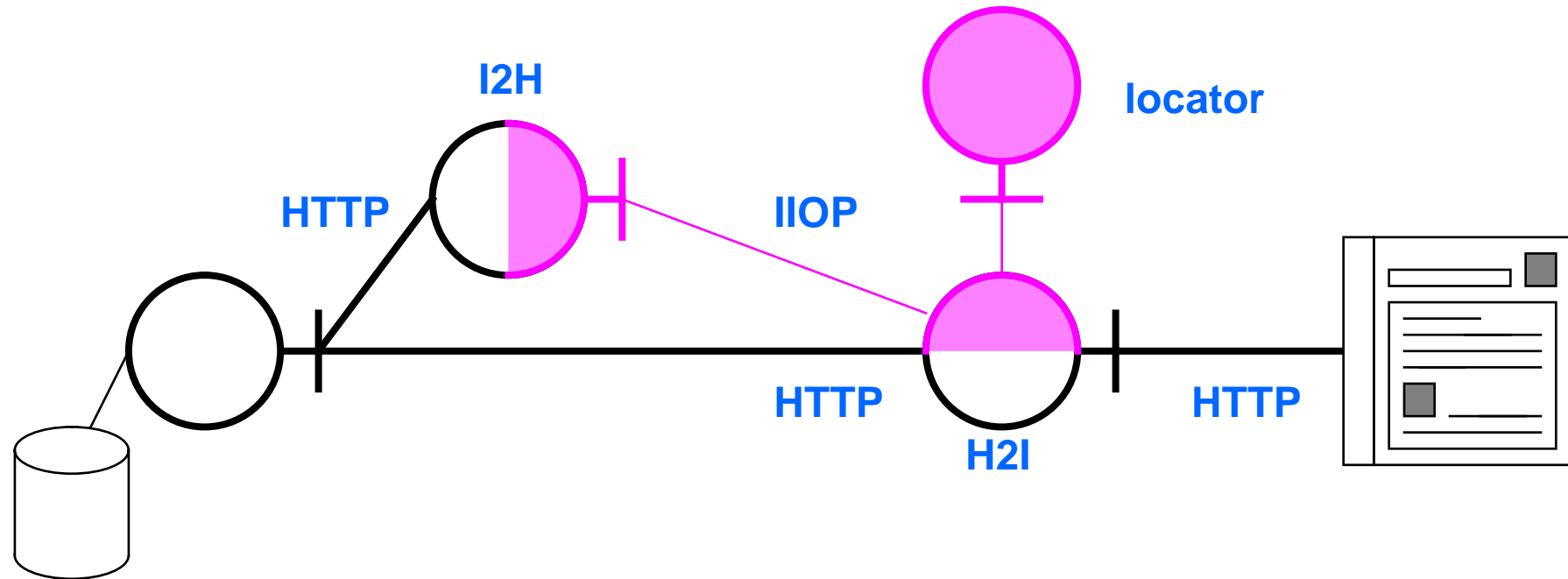
Gateways Exploit the Proxy Mechanism

- H2I: takes HTTP to IIOP, used like a proxy
- I2H: takes IIOP to HTTP

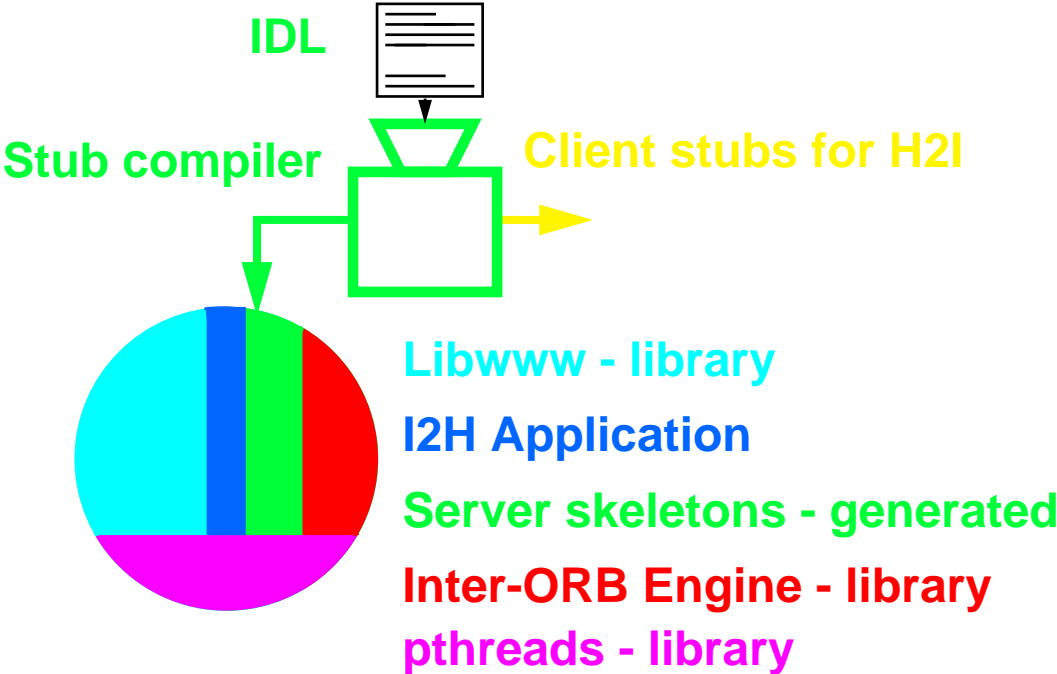


Locator

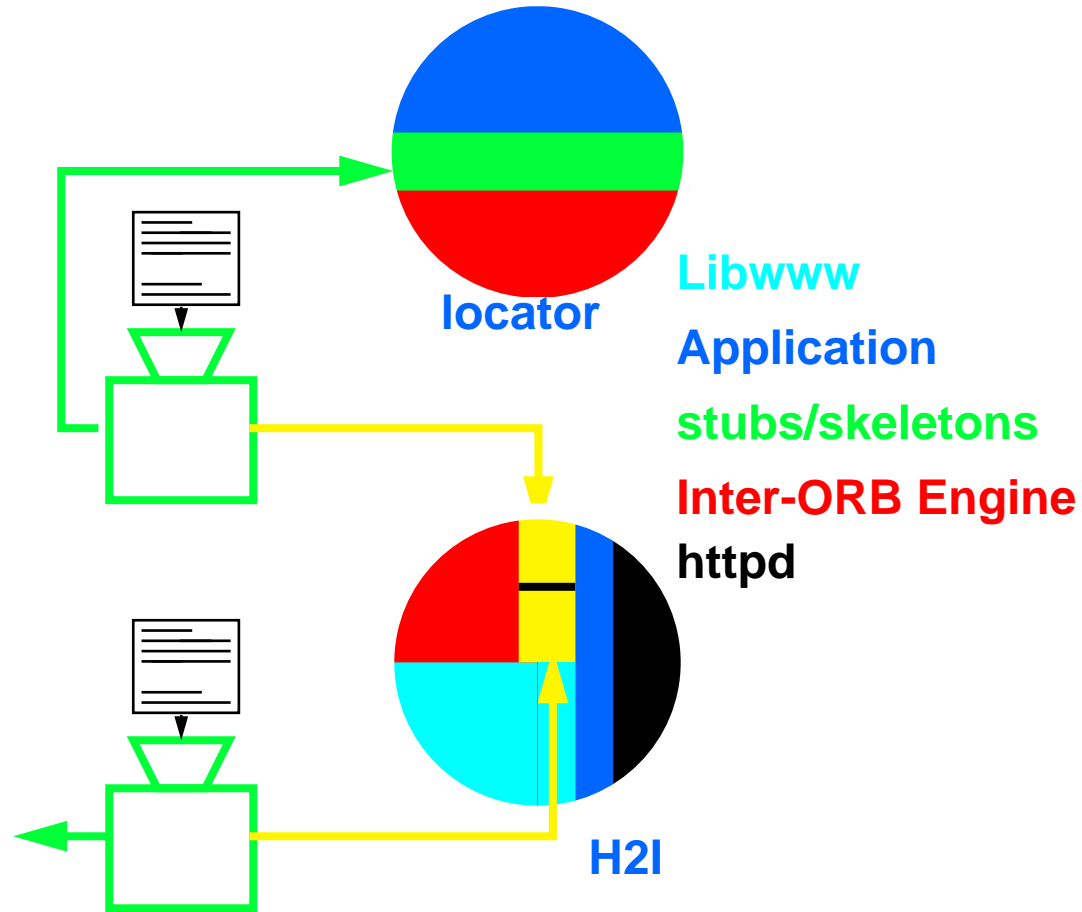
- Finds IIOP paths for H2I or other client
- H2I can fall back to HTTP



Structure of the IIOP to HTTP Gateway



Structure of the HTTP to IIOP Gateway and Locator



The Components we used

- We used publicly and freely available components.
- W3 Reference Library from W3C
- SunSoft Inter-Orb Engine (via OMG)
- Stub Compiler
 - SunSoft IDL compiler front end
 - ANSA back end for IOE
- MIT pthreads



What We Can Do With It

- HTTP-IIOP-HTTP tunnelling with dynamic URL translation
- Object invocation via an ORB as an alternative to CGI
- Web browser becomes uniform user interface for CORBA
- Experiment with other ORBs
 - Proof of concept: Orbix from Iona in place of IOE



Where You Can Get It

- Publicly available by anonymous FTP
- See <URL:<http://www.ansa.co.uk/ANSA/ISF/>>
 - ANSA Information Services Framework Group
 - Built under the ANSAweb Project
- ANSA sponsors experimenting with it



What Was Learned

- **Interoperability is achievable and practical**
 - ANSAweb built with existing freely available technology components
- **Existing technology/information investments preserved and enhanced**
 - no change to existing resources
 - more existing resources become accessible
- **Worth doing to leverage existing CORBA systems**
 - Existing heavy investments in CORBA accessible via WWW



Transatlantic IOP

- Presented at the Fourth International World Wide Web Conference
 - Presented in Boston MA, USA
 - Presentation delivered live via IOP from Cambridge, UK

