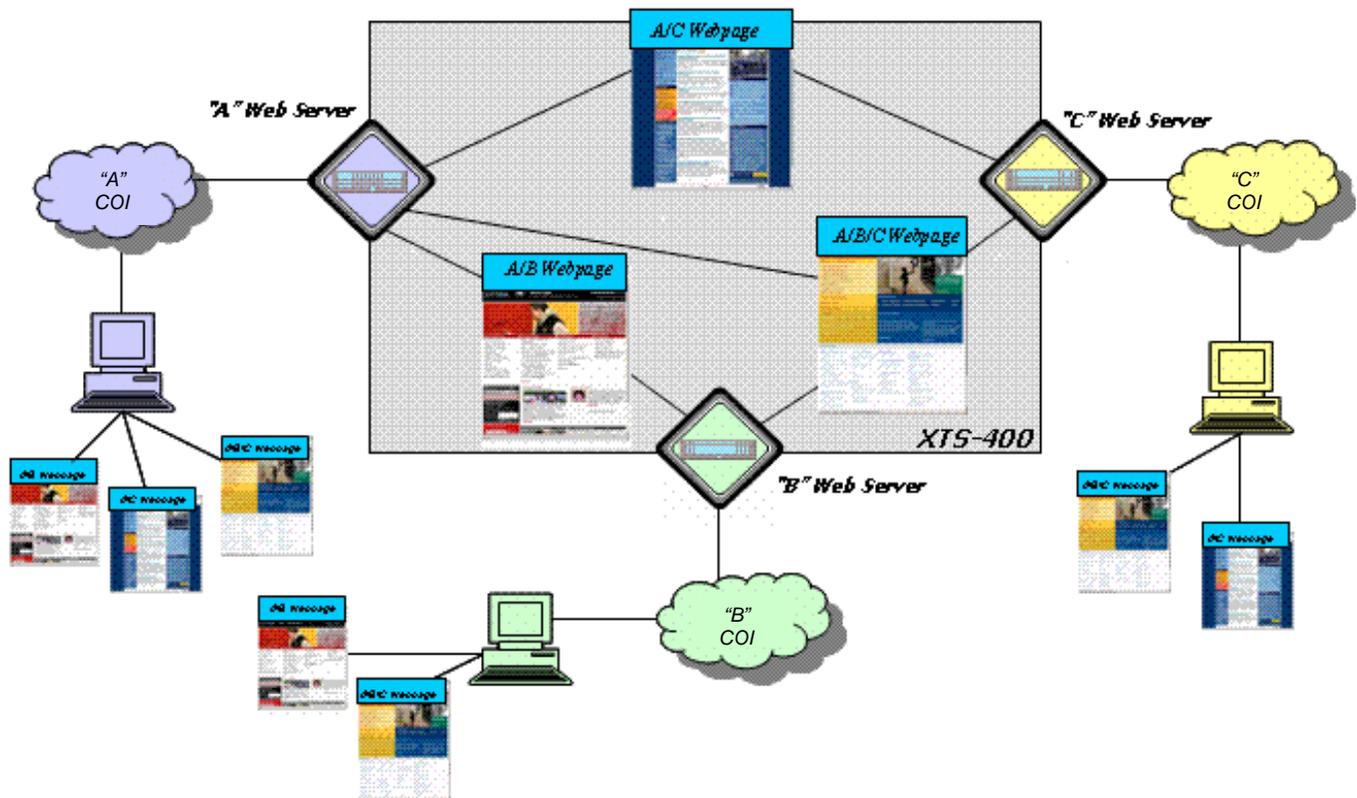




Multi-Level Web Server



Background

Most communities employ various web technologies to support mission operations. Web applications generally constitute the preferred method of transferring data because they provide excellent assurance of delivery, are readily available to most users and work fairly well in disadvantaged bandwidth environments. However, each community must maintain web servers in their respective security enclaves, and in order to share information with other Communities of Interest (COI) they must implement either expensive or low assurance techniques to synchronize web content between servers.

The US Naval Research Laboratory has developed a hybrid architecture that introduces Multi-Level Secure (MLS) technology into environments consisting of Multiple Security Levels (MSL), and applied this schema as the basis for a Multi-Level Web (ML Web) server. This ML Web server

eliminates cross-domain content synchronization problems, reduces administrative burdens, and almost certainly reduces the cost of sharing information.

This unique hybrid architecture consists of three functions:

1. Web services hosted on a Multi-Level Secure (MLS) server.
2. Individual web servers at each network level (MSL).
3. A guard function that mediates data writes between network levels via a trusted process.

These three functions are integrated on a single trusted server. The underlying Operating System (OS) of the ML Web Server is STOP 6.x, developed by BAE. The hardware platform is the XTS-400/410. STOP has been evaluated at the EAL 5 (Augmented) level.

Functional Requirements

Manageable: The system is managed locally by a single system administrator.

Scalable: The system is able to support a large number of users, and connect up to 15 disparate network levels.

Secure: The system provides a high level of assurance that connected users cannot compromise the integrity of any connected network, that the identity of its users is authentic and that it is resistant to network-based penetration attacks.

User-friendly: The system is intuitive and simple for users. The system is literally a social and cultural border in addition to being a network border, it requires minimal training.

User Interface

The MLWeb server is a solution that integrates well with existing client web applications such as Internet Explorer (IE), Firefox or Netscape. A user merely connects to their single level web interface on the ML Web server and authenticates. A high assurance registration process allows users to activate their own accounts.

System Administration

A system administration workstation is collocated with the ML Web server and provides a Graphical User Interface (GUI) for administration functions such as user creation and deletion. The system administrator configures user privileges based on pre-defined user profiles. Access to multi-level web space is granted for each user based on their network level. Furthermore, user access control lists are used for private web pages. Users wishing to access private web pages must be on the access control list and authenticate before access is granted.

Data Transfer/Posting

The system can be configured to support posting of several data types including PDF, imagery, Microsoft Word, Powerpoint and Excel. A content validation process ensures only allowable content is posted. All users have read access to pre-defined web pages, only strongly authenticated users have write access for uploading content.

Development Sponsor

The Multi-Level Web server was developed by the US Naval Research Laboratory through research sponsored by the US Office of Naval Research.

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