

*A Technology Whitepaper*

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# **Next Generation Messaging**

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*This paper describes Worldtalk products and solutions.  
These directory-based software products are designed to enable organizations  
to build, evolve and expand their messaging networks, while leveraging their existing infrastructure.  
The paper briefly describes features and functionality of Worldtalk Product Lines and  
discusses typical network deployment strategies.*

## 1. Overview

E-mail has become the most prominent network application. According to major industry analysts, companies today depend more and more on e-mail to conduct day-to-day business. E-mail usage varies from one organization to another. Such usage ranges from a pure and simple communications mechanism among employees to a platform for all workflow applications, electronic commerce, and line of business applications. This usage has driven network capacity to new limits. In fact, e-mail accounts for 60% of network traffic within a Local Area Network and 75% of traffic within a Wide Area Network. While the network infrastructure (bridges and routers) in most organizations has been revamped to sustain such growth in network traffic, the e-mail infrastructure, if any, is still in catch-up mode.

In fact, most e-mail infrastructures were designed "after-the-fact". Companies found themselves with several incompatible e-mail systems, from host-based such as IBM PROFS and Fischer TAO/EMC2, to LAN-based systems such as Lotus cc:Mail and Microsoft Mail, to proprietary client-server based groupware applications such as Lotus Notes and Microsoft Exchange. The initial solution implemented to connect these incompatible e-mail systems together was a series of point-to-point gateways, loosely tying-up the e-mail systems together. However, as e-mail usage continued to grow, gateways became the weakest link in the network and the bottleneck as well.

The emergence of the importance of the Internet and the Intranet initiated a drive towards desktop consolidation around a single communication application-The Browser. Companies are being driven to consolidate their intranet architecture with their messaging and directory backbones, and migrate users to standards-based applications such as POP3/IMAP4 e-mail applications and LDAP directory services. In fact, IDC predicts that intranet messaging will affect 72% of corporate e-mail networks in 1997, and 32% of organizations will start rolling out standards-based messaging and directory systems. Initial return on investment for standards-based e-mail is relatively high, but so is the challenge of integrating them with the existing e-mail backbone.

Worldtalk Corporation's messaging and directory solutions can overcome this challenge. Worldtalk Corporation provides directory-based software solutions which allow organizations to integrate their e-mail and directory systems with their intranets and provide a scaleable, efficient, standards-based and secure e-mail and directory infrastructure.

This documents describes Worldtalk products and software solutions. These are divided into three categories:

I. Enterprise Solutions - NetJunction™ Product Line, allows organizations to integrate all their proprietary e-mail and directory applications and provides consolidated access to the Internet and X.400 VANS

II. Departmental Solutions - NetTalk™ Product Line, which allows organizations to deploy standards-based messaging and directory systems (POP3/IMAP4/LDAP) and connects them to client/server groupware systems such as Lotus Notes and Exchange

III. Security Solutions - WorldSecure™ Product Line, which allows organizations to deploy desktop-to-desktop, or firm-to-firm, e-mail security solutions over the existing e-mail infrastructure.

This document briefly discusses the network architecture of the Worldtalk Product Lines and outlines major benefits, design criterion, and features. Please contact Worldtalk Corporation for a complete description of each of the product lines.

## 2.0 The Complete Picture

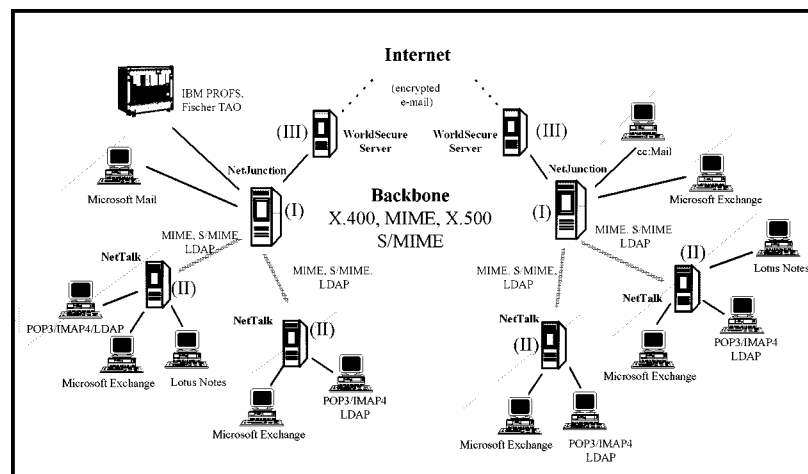
Figure 1 shows an example e-mail and directory infrastructure using Worldtalk products.

At the heart of the Network, NetJunction, the HP-UX based e-mail and directory switch, provides the following services:

- Connectivity among e-mail and directory applications (host-based, LAN-based, proprietary client/server-based, and intranet-standards-based)
- Consolidated access to the Internet and X.400 VANs
- Flow Control and Virus checking on traffic incoming from the Internet and X.400 VANs and between proprietary systems
- Internet-exposed directory services using the LDAP protocol

Within departments, NetTalk, the Windows NT-based Intranet e-mail and directory solution, provides the following services:

- POP3/IMAP4 Message Stores for standards-based e-mail clients (Eudora, Microsoft Internet Explorer, Netscape Communicator, Esys Simeon, etc.)
- LDAP-based directory services allowing all clients to use NetTalk as their sole directory server
- Connectivity to Lotus Notes, Microsoft Exchange, and other LAN-based system to provide local switching and allow choice of applications for users and departments



**Figure 1: Typical e-mail and Directory Infrastructure Using Worldtalk Products**

As an overlay to the existing messaging infrastructure, the WorldSecure product line is a complete set of tools for securing already-deployed enterprise e-mail and groupware applications. It is a security overlay; it does not require that you throw away your existing investments in e-mail and groupware infrastructure and thus saves you time and money, and eliminates the need for retraining your end users on a new e-mail system. With it, your organization can:

- Secure internal desktop to desktop e-mail
- Secure e-mail over the Internet for e-commerce applications
- Define and enforce bi-directional e-mail access controls and content policies for SPAM and nuisance mail filtering, screen e-mail for viruses before they multiply throughout the organization, and provide a detailed audit trail of e-mail activity for specific sets of users.

All of these benefits are designed to fit within the context of an existing public key infrastructure (PKI), or alternatively, WorldSecure can be used as the foundation for creating an application-independent PKI for secure e-mail solutions.

The following are value propositions of the Worldtalk Solution:

- Management of Change**
  - Architecture allows easy integration of any "new" e-mail and directory application into the backbone
  - Solution is ideal for mergers and acquisitions. It allows efficient and secure integration of e-mail and directory networks
- Scaleability**
  - Both enterprise solution and departmental solutions are available
  - Architecture allows thousands of messages/hour per server throughout the backbone (The largest Worldtalk customer routes 5 million messages a week, and supports over 100,000 users)
- Management and Control**
  - Centralized and distributed management of the entire backbone
  - Consolidated and distributed directory services infrastructure with directory synchronization ensuring the correctness and consistency of information
- Security**
  - Organization-wide security policies independent of the underlying e-mail network
  - Ability to define and enforce security policies throughout the organization
  - Worldtalk products are the only products available today that allow you to deploy standards-based e-mail security over your existing network

### 3.0 Enterprise Solution - The Backbone

As shown in Figure 1, **NetJunction** is the heart of the e-mail backbone. NetJunction runs on HP-UX (HP 9000 servers from Hewlett Packard) and provides e-mail and directory synchronization connectivity to over 14 e-mail and directory systems. Based on industry standards (1988/1992 X.400 and SMTP/MIME for e-mail, and 1993 X.500 and LDAP for directory services), NetJunction merges heterogeneous and less-scaleable e-mail systems into a scaleable, efficient, standards-based e-mail and directory backbone. This is your fastest way towards intranet-compliant e-mail and directory services. It lets you fully leverage your existing investment in e-mail and directory products.

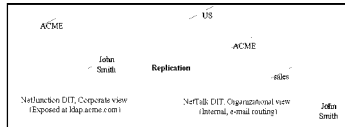
Communication between NetJunction Servers uses X.400 or SMTP/MIME for e-mail and X.500 for directory services.

***Why X.500?** X.500 is ideal for backbone directory services. It provides the much needed robustness and flexibility required at the backbone. Its protocols (such as DISP and DSP) are more mature than those of LDAP especially for replication and chaining. 1993 X.500 also contains richer access control which are critical for backbone directory services especially when the service is extended to departments, multiple sites, and to the Internet.*

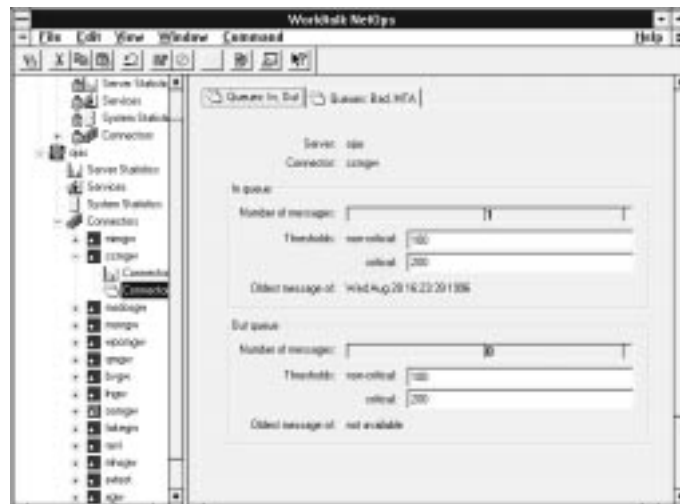
NetJunction consists of a server running on HP-UX that provides message translation, directory synchronization, white and yellow page directory services, Internet message flow control and virus checking. By centralizing Internet traffic through NetJunction, you can guarantee a virus-free e-mail environment. It also consists of Access Units that reside on a specific e-mail system network (the cc:Mail network for example) and provide connectivity to the NetJunction Server (both e-mail and directory synchronization).

NetJunction also contains a high-end LDAP server exposing the company directory (or a subset of that directory) internally through the intranet or to the outside world through the Internet. Using an LDAP compliant browser (such as Netscape Communicator and Internet Explorer) you get access to the corporate directory. An HTML interface is also available for systems that do not yet support the LDAP protocol. The NetJunction Directory Information Tree (DIT) is very flexible, it can be tailored to match your existing organization hierarchy. It is also independent of the NetTalk DIT (discussed later in this document) so that you can maintain an externally visible name space independent of all directory hierarchies used within your departments. This gives you ultimate flexibility in your naming schemes.

Figure 2 shows an example in which the exposed tree (to the outside world through the Internet) is different than the organizational tree adopted internally.



**Figure 2: Flexible Directory Services**



**Figure 3: Example NetOps monitoring window**

NetJunction also contains NetOps™, an NT-based, fully SNMP compliant management station that allows administrators to remotely manage one or many NetJunction servers. NetOps monitors message queues, NetJunction Servers, NetJunction directory services, etc., among other items. Figure 3 shows an example NetOps monitoring window.

NetOps uses the industry standard SNMP protocol to monitor one or many NetJunction Servers. NetOps presents a graphical view of the NetJunction network.

You can also use any other SNMP compliant management framework (like HP OpenView) to monitor your e-mail backbone and all NetJunction Servers. Available with NetJunction is a co-resident SNMP-compliant management agent that monitors the servers and communicates using SNMP to the monitoring station.

The following are value propositions of the NetJunction solution:

- Scaleability**
  - Architecture allows thousands of messages/hour per server throughout the backbone (The largest Worldtalk customer routes 5 million messages a week, and supports over 100,000 users)
  - Fully scaleable directory services solutions designed for millions of entries (actually tested with 300,000 entries)
- Transparency**
  - Requires no-change to naming conventions used within departments
  - Fully flexible addressing schemes hiding all complexities of X.500, X.400, or the Internet from departments

- Flexibility**
- Fully flexible directory services and naming conventions
  - Fully flexible directory synchronization mapping rules and filtering
- Complete Fidelity**
- Complete mapping of message headers and service elements (priority, cc's, bcc's, etc.)
  - Complete preservation of body parts (attachments, Active/X links and embedded objects, HTML forms, Rich Text Formats, etc.)
  - Support for multiple character sets (including Kanji (Japanese) and all European character sets)
- Management**
- SNMP-based management agent co-resident with every NetJunction Server
  - Windows NT-based management station (NetOps) allowing off-the-shelf management of the NetJunction backbone
- Control**
- Centralized access to the Internet and X.400 VANs with total flow control
  - Complete Virus checking insuring quality service levels

## 4.0 Departmental Solution - NetTalk

Referring again to Figure 1, NetTalk extends the e-mail backbone to your departments. It offers standards-based e-mail and directory services and complete connectivity to Lotus Notes, Microsoft Exchange, and other LAN-based systems. NetTalk includes POP3 and IMAP4 message stores, an X.500 directory exposing the LDAP interface, and connectors to other mail systems. It allows you to fully adopt Internet standards for your e-mail and directory applications.

You can use NetTalk as your e-mail and directory server for both Internet Explorer and Netscape Communicator, eliminating the need for additional hardware and software.

NetTalk itself communicates with NetJunction using SMTP/MIME for e-mail and pure LDAP replication for directory services. This offers complete flexibility in what naming conventions and directory naming structures are utilized.

***Why LDAP Replication?** LDAP replication is simpler (and lighter weight) than X.500 DISP and suitable for departmental usage. It offers complete flexibility to departments and allows them to define their own hierarchy (independent of the corporate hierarchy) and still be able to fully replicate with the master backbone X.500 directory service.*

NetTalk runs on a single Windows NT application server. It includes an easy-to-use graphical user interface and management tools. NetTalk offers complete end-to-end message tracking and queue monitoring allowing simple administration of the NetTalk server.



**Figure 4: NetTalk Management Interface**

Figure 4 shows the directory management section of the NetTalk user interface. It shows the directory hierarchy and the ability to manage user information from a single location.

NetTalk allows departments to retain the choice of naming conventions and addressing schemes and yet still be fully replicated with the corporate backbone. NetTalk also makes all communications between departments (through the backbone) fully Intranet compliant.

The following are value propositions of the NetTalk solution:

- Ease-of-use**
  - NetTalk is a fully shrink-wrapped off-the-shelf solution ideal for departments within large organizations
  - Built-in wizards help the installation, configuration, and management procedures
- Consolidation**
  - Complete consolidation of corporate intranets with messaging and directory applications
  - Consolidation of departmental directory solutions around LDAP
- Flexibility**
  - Fully flexible directory services and naming conventions
  - Fully flexible directory synchronization mapping rules and filtering
  - Complete choice of e-mail application (Navigator, Explorer, Eudora, cc:Mail 7.0, etc.)
- Complete Fidelity**
  - Complete mapping of message headers, service elements (priority, cc's, bcc's, etc.)
  - Complete preservation of body parts (attachments, Active/X links and embedded objects, HTML forms, Rich Text Formats, etc.)
  - Support for multiple character sets (including Kanji (Japanese) and all European character sets)
- Management**
  - Easy-to-use management tools
  - Consolidates e-mail server and directory server management with that of the switch (Same machine, same backup tools, same user interface, etc.)

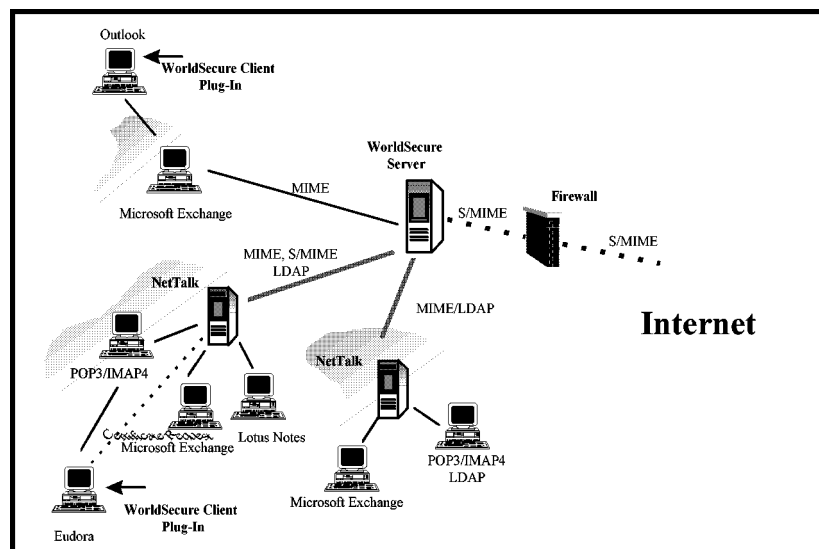
## 5.0 Security Solution - WorldSecure

A complete secure e-mail solution for the enterprise consists of the following components:

- (i) A Secure client
- (ii) An e-mail firewall
- (iii) A Certificate server
- (iv) A Certificate authority

WorldSecure provides items (i) the WorldSecure Client, (ii) the WorldSecure Server, and (iii) the WorldSecure Certificate Server (which is the X.500/LDAP directory found in NetTalk or NetJunction), respectively, and integrates seamlessly with item (iv) from various vendors. Figure 5 shows how these items fit in the enterprise.

WorldSecure is a complete overlay to the existing e-mail infrastructure. Working closely with NetTalk and NetJunction, it offers a comprehensive security solution that complements traditional firewalls.



**Figure 5: WorldSecure Product: Comprehensive e-mail security solution for the enterprise**

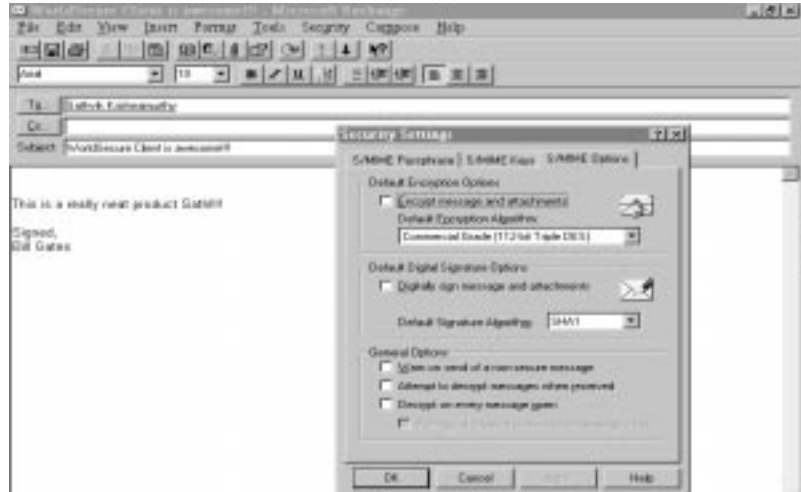
WorldSecure Client (Secure Messenger) works with any existing e-mail client to provide desktop-to-desktop e-mail security. Using the emerging S/MIME standards (endorsed by RSA, Netscape, Microsoft, Worldtalk, Verisign, among others), WorldSecure Client encrypts and digitally signs e-mail messages to ensure the authenticity and privacy of the messages. Originators can guarantee only the intended recipient(s) can read the message and can validate that the message is from stated originator.

WorldSecure Client works over any existing e-mail backbone. It does not require the organization to fully adopt an SMTP backbone. You can transfer S/MIME messages over Exchange, cc:Mail, or any other backbone. This makes it the only available solution in the market today that allows you to deploy an interoperable e-mail security solution over your existing network.

WorldSecure Client requires the use of X.509 digital certificates that could be self signed (self generated) or requested from Verisign (<http://www.verisign.com>).

**Why X.509 ?** X.509 is becoming the industry standards for certificates. It is endorsed by major Internet vendors such as Verisign, Microsoft, and Netscape. It is a mechanism to ensure proper interoperability among security solutions from different vendors. Worldtalk is committed to the support and promotion of X.509 as the sole standard for digital certificates.

WorldSecure Client works with any existing PKI (Public Key Infrastructure). It can store certificates locally (person-to-person certificate exchange) or use the Worldtalk backbone directory (NetTalk, NetJunction, etc.) as a certificate store. Access to that store is done via LDAP. LDAP also allows users to submit their own certificates to the store (including certificates retrieved from Verisign).



**Figure 6: WorldSecure Client: a true plug-in application**

The WorldSecure Server is a new product category called an electronic mail firewall that plays an extremely important role in enforcing security policies for the enterprise. Typically deployed on a stand-alone machine on the safe-side of your firewall, the WorldSecure Server replaces (or complements) your existing Internet relay host with a high-performance, e-mail clearinghouse. The e-mail firewall is an essential component to any secure e-mail solution. Why? Because use of desktop e-mail encryption products are totally up to the discretion of end-users. Bad judgment by the end-user as to when messages should be encrypted and/or digitally signed, means information assets are at risk. This must be enforced centrally.

The following list exemplifies how the WorldSecure Server can be used:

- (i) to protect information assets before they leave for the Internet by enforcing access control, content filter, virus scanning, encryption, and digital signature policies
- (ii) to enforce security policies between your organization and business partners using the S/MIME protocol for electronic commerce
- (iii) to protect your organization's internal network from SPAMs, hate mail, and other nuisance mail with comprehensive content filtering
- (iv) to screen e-mail for viruses before they multiply throughout your organization
- (v) to provide a detailed audit trail of e-mail activity for specific sets of users, for general purposes and/or suspicious activity monitoring

One of the most important aspects of the WorldSecure Server is that all of the aforementioned capabilities are integrated into a single product, in a modular fashion such that your organization can pick and choose which features to use and which ones to not use. For example, if an S/MIME message comes in from the Internet, the message can be decrypted, then scanned for viruses before being sent onward into the organization. But if the company already has desktop virus scanners, then the WorldSecure Server can easily be configured to disable that feature. Regardless of how the product is used however, the WorldSecure Server allows your organization to keep its existing e-mail infrastructure intact, while providing value-added security benefits, transparent to the end-user.

The following are major value propositions of the WorldSecure solution:

- Complete Flexibility**
- WorldSecure works with any existing e-mail infrastructure
  - WorldSecure works with any Public Key Infrastructure
  - Users don't have to change their e-mail application of choice to use security products

- Interoperability**
- Full support of the S/MIME standard endorsed by major vendors
  - Complete usage of X.509 V3 certificates

- Enterprise-wide security policies**
- Ability to define and enforce organization-wide security policies
  - WorldSecure is an overlay over the existing e-mail infrastructure
  - Same security policy independent of the department or application

- Virus-free e-mail network**
- Server-based virus scanning
  - Totally transparent to end-users

## **6.0 Summary**

Worldtalk e-mail and directory products allow organization to transform their existing e-mail networks into a standards-based intranet messaging and directory backbone that is robust, scaleable, and capable of hosting a wide variety of applications such as workflow, electronic commerce, business-to-business document exchange. As more sensitive data (in terms of numbers and relative sensitivity) is exchanged over e-mail, securing that data is a requirement. Worldtalk's security solutions fulfills that requirement.

In addition to the software solutions, Worldtalk's experienced team of consultants are available to assist in the design, management, and roll-out of messaging and directory networks.

Please contact Worldtalk Corporation (<http://www.worldtalk.com>) for more information on Worldtalk products and services.