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Technical Reference
Model Version 2.0,
November 1, 1996

**UNITED STATES
PATENT AND TRADEMARK OFFICE**

TECHNICAL REFERENCE MODEL

Version 2.0



November 1, 1996

**Chief Information Officer
Office of System Architecture and Engineering
Washington, D.C. 20231**



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
ASSISTANT SECRETARY AND COMMISSIONER
OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

November 1, 1996

1. PURPOSE. To establish the set of standards, protocols, and products which make up the United States Patent and Trademark Office (USPTO) information technology infrastructure.
2. AUTHORITY. This publication is published under the auspices of the Chief Information Officer (CIO), USPTO.
3. APPLICABILITY. The concepts expressed in this guideline shall be applied to all automated system projects.
4. SCOPE
 - a. Compliance. Compliance with the provisions of this document is required unless a specific waiver is authorized.
 - b. Waivers. Waivers to the provision of this publication will be authorized only by the CIO on a case-by-case basis.
5. REVISIONS. This revision clarifies system development environment tools, adds Internet/Intranet services, and designates product managers. It supersedes Technical Reference Model Version 1.1, dated December 13, 1995.
6. RECOMMENDATIONS. Recommendations concerning the contents of this technical publication should be forwarded to the Office of System Architecture and Engineering or the Software Engineering Process Group.
7. APPROVAL. Automated Information System technical architecture and design documents, written to comply with this Technical Reference Model, shall be approved by the Project Manager, Director, System Architecture and Engineering, and Director, System Quality and Enhancement. The CIO and Program Sponsor will resolve conflicts over the use and applicability of the Technical Reference Model.

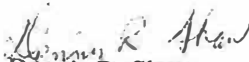

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Checkpoint Software Technologies.	FireWall-1	Security Authentication and Internet network management functions	Windows (Internet)
Microsoft Corporation	Exchange	Windows	Integrate PTO mails and Internet mails
Netscape Communications Corp	Enterprise Server	As Enterprise Server	Windows, UNIX, Macintosh

4.11 SECURITY SERVICES

4.11.1 Data Encryption Standard (DES)

PTO Need: The DES data encryption standard provides PTO capability to protect unclassified information from unauthorized disclosure or undetected modification during transmission or while in storage. It is used on some of PTO major automated information systems for application such as password protection, access control, and privacy protection of some patent information, and sensitive data.

Title of Required Standard: Data Encryption Standard (DES) - FIPS 46-2 (also ANSI X3.92-1981)

Standard Overview: Data encryption (cryptography) is utilized in various applications and environment. In general, cryptography is used to protect data while it is being communicated between two points or while it is stored in a medium vulnerable to physical theft. The Data Encryption Standard (DES) specifies an algorithm which is used to encrypt and decrypt sensitive data, to provide for its confidentiality. The DES is a publicly known cryptographic algorithm that converts plain text to ciphertext using a 56-bit key. The same algorithm is used with the same key to convert ciphertext back to plaintext, a process called decryption. The DES consists of 16 "rounds" of operations that mix the data and key together in a prescribed manner using the fundamental operations of permutation and substitution. The goal is to completely scramble the data and key so that every bit of the ciphertext depends on every bit of the data plus every bit of the key.

List of Products Used by PTO: The following proprietary security encryption products are under evaluation by the PTO Information Technology Laboratory (ITL).

Vendor Name	Product Name	Function Provided	PTO Platform
Security Dynamics	SecureID (Smart Card)	Generate Random Passwords	Windows for Workin Group, Windows 3.1
Computer Associates	ACF2	Mainframe Security	IBM mainframe
Checkpoint Software Technologies	FireWall-1	Security Authentication	PTOnet & Internet
Algorithmics	RiskWatch	AIS Security Risk Analysis	IBM
Microsoft Corporation	Security Account Manager	Security Account Management	Windows NT 4.0 (built in)
	V Scan	Virus Scan	Windows
	F-Prot	Virus Scan	
Los Altos Technologies, Inc	UniShred Pro (UNIX rm Command)	Recursively Overwrite all Remnants of a Deleted Secure File	UNIX (PICS Server)
Information Security Corp	SpyProof	data encryption	to be provided
AT & T	Secret Agent 3.0	RSA & DSA public keys	DOS, Windows, Mac UNIX
to be provided	Veil	data encryption	to be provided

Preferred Product(s) for PTO to Evolve to:

Vendor Name	Product Name	Function Provided	PTO Platform
Security Dynamics	SecureID (Smart Card)	Generate Random Passwords (to limit access to PTOnet)	Windows, 3.1 or Windows for Work Groups
Computer Associates	ACF2	Mainframe security	IBM mainframe
Checkpoint Software Technologies	FireWall-1	Security Authentication	PTOnet & Internet
Algorithmics	RiskWatch	AIS Security Risk Analysis	
Microsoft	Security Account Manager	Security Account Management	Windows NT 4.0 (built in)
Los Altos Technologies, Inc	UniShred Pro	Recursively Overwrite all Remnants of a Deleted Secure File	UNIX (PICS Server)

4.11.2 Digital Signature Standard (DSS)