



Standard ID:	SE-SDT-001
Title:	Secure File Transport
Domain:	Security
Discipline:	Network Security
Effective Date:	8/18/2015
Revision no.:	5
Original date:	09/01/2004

I. Authority, Applicability and Purpose

- A. **Authority:** Title 29, Chapter 90C provides broad statutory authority to the Department of Technology and Information to implement statewide and interagency technology solutions, policy, standards and guidelines for the State of Delaware's technology infrastructure. "Technology" means computing and telecommunications systems, their supporting infrastructure and interconnectivity used to acquire, transport, process, analyze, store and disseminate information or data electronically. The term "technology" includes systems and equipment associated with e-government and Internet initiatives.
- B. **Applicability:** Applies to all State of Delaware communications and computing resources. DTI is an Executive Branch Agency and has no authority over the customers in Legislative and Judicial Branches, as well as School Districts, and other Federal and Local Government entities that use these resources. However, all users, including these entities, must agree to abide by all policies, standards promulgated by DTI as a condition of funding, access and continued use of these resources.
- C. **Purpose:** This standard will address the solution set to be used by employees and agents of the State of Delaware to secure data classified as confidential or higher per [Data Classification Policy](#) while moving data from point A to B as it is transported across a network.

II. Scope

- A. **Audience:** - This document is intended for Systems Administrators, Network Administrators, Computer Auditors, and Application Development personnel, Project Leaders, Third Party Software Providers and non IT personnel.



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- B. **Functions:** The Organization Information Security Officer (ISO) and Information Resource Manager (IRM) in concert with the business managers of the State organization are to determine the level of security needed. This standard will cover data determined to require extra security in transport. Once determined, the tools outlined in this document are to be used to secure it. This standard does not cover secure email or attachments. They are covered by the [Secure Email Standard](#).
- C. **Areas Covered:** This standard covers all data that is to be secured as it is being moved from point A to point B. This standard applies to all data that is owned or maintained by the State of Delaware and will encompass those security requirements mandated by various Federal regulations such as the Health Insurance Portability and Accountability Act of 1996 (HIPAA), Sarbanes-Oxley, and Gramm-Leach-Bliley. This standard will also reflect any applicable court rulings or opinions of the State Attorney General or other data requiring encryption security. This standard does not address what data should be secured. For an aid in determining a reasonable level of data security please consult the [Data Classification Policy](#).
- D. **Platforms:** Any device being used to move data from point A to point B. This includes State owned servers, mainframes, PC's, notebooks (laptops), and tablet PC's. All third party servers, mainframes, PC's, notebooks (laptops), and tablet PC's that are connected behind the State's firewall are also covered by this standard.

III. PROCESS

- A. **Adoption:** These standards have been adopted by the Department of Technology and Information (DTI) through the Technology and Architecture Standards Committee (TASC) and are applicable to all Information Technology use throughout the state of Delaware.
- B. **Revision:** Technology is constantly evolving; therefore the standards will need to be reviewed regularly. It is the intent of the TASC to review each standard annually. The TASC is open to suggestions and comments from knowledgeable individuals within the state, although we ask that they be channeled through your Information Resource Manager (IRM).
- C. **Contractors:** Contractors or other third parties are required to comply with these standards when proposing technology solutions to DTI or other state entities. Failure to do so could result in rejection by the Delaware Technology Investment Council. For further guidance, or to seek review of a component that is not rated below, contact the TASC at dti_tasc@state.de.us.
- D. **Implementation responsibility:** DTI and/or the organization's technical staff will implement these best practices during the course of normal business activities, including business case review, architectural review, project execution and the design, development, or support of systems.
- E. **Enforcement:** DTI will enforce these best practices during the course of normal business activities, including business case and architectural review of proposed projects and during the design, development, or support of systems. These best practices may also be enforced by others during the course of their normal business activities, including audits and design reviews.
- F. **Contact us:** – Any questions or comments should be directed to dti_tasc@state.de.us.

These standards are adopted by the Department of Technology and Information (DTI), through the Technology and Architecture Standards Committee (TASC), and are applicable to all Information Technology use throughout the State of Delaware. Any questions or comments should be directed to dti_tasc@state.de.us.



IV. Definitions/Declarations

A. Definitions/Explanations

1. **Application Encryption:** Data is scrambled by the application before it is stored in the database; database queries return scrambled data that can only be unscrambled by the application. The data is scrambled in the transport stages.
2. **Asymmetric Key Encryption:** In asymmetric key encryption, also known as "public key" encryption, each person has two keys. Any scrambled text created using one of the keys can only be de-scrambled using the other key. This is distinctly different from symmetric encryption where you only have one key that performs both functions on the same message. In asymmetric key encryption, the two keys that each person possesses are commonly named the "private" and "public" keys because the "public" one is published or given out freely to anyone who wants a copy and the "private" one is kept secret. The security of asymmetric key encryption depends on the fact that no one except you can ever access your private key. It must be noted that Asymmetric Key Encryption can be 100 to 1,000 times slower than Symmetric cryptography.
3. **Certificate Authority:** Issues and manages security credentials and public keys for message encryption.
4. **Checkpoint Restart:** In the event of an interruption during a file transport this provides a means of automatically restarting the transport at the point where the transport was interrupted, rather than at the beginning of the file.
5. **Column-level Encryption:** Fields within the database are scrambled based on their column; only authorized users see the plain text results. Unauthorized users see scrambled or blank results for those columns that are scrambled. Data is scrambled only in the rest stage.
6. **Common Public Key Algorithms:**
 - a) **RSA-**for both digital signatures and key exchange. The Rivest-Shamir-Adleman (RSA) cryptographic algorithms are the most widely used public-key algorithms today, especially for data sent over the Internet. The algorithm is named after its three inventors, Ron Rivest, Adi Shamir, and Leonard Adleman. The security of the RSA algorithm is based on the difficulty (in terms of computer processing power and time) of factoring large numbers. RSA is unique among the commonly used public-key algorithms in that it is capable of both digital signature and key exchange operations. The RSA cryptographic algorithms are supported by the Microsoft Base Cryptographic Service Provider (Microsoft Base CSP1) and the Microsoft Enhanced Cryptographic Service Provider (Microsoft Enhanced CSP2) and are built into many software products, including Microsoft Internet Explorer.



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- b) DSA-for digital signatures only. The Digital Signature Algorithm (DSA), invented by the United States National Security Agency (NSA), has been incorporated by the U.S. National Institute of Standards and Technology (NIST) into their Federal Information Processing Standard (FIPS) for digital signatures. DSA derives its security from the difficulty of calculating discrete logarithms. This algorithm can be used only for digital signature operations (not for data encryption). Microsoft CSPs support the DSA algorithm.
 - c) Diffie-Hellman-for key exchange only. Diffie-Hellman, the first public-key algorithm invented, is named after its inventors Whitfield Diffie and Martin Hellman. Diffie-Hellman derives its security from the difficulty of calculating discrete logarithms.
7. Confidentiality (encryption): Protecting data from exposure to unauthorized entities. In addition, it is also referred to as privacy.
 8. Data Encryption: The process of converting plain text into scrambled text in such a fashion that only the intended recipients can decrypt the text back into plain text.
 9. Digital Signature: A core component of a public key infrastructure (PKI) security installation. A digital signature can prove identity because it is created with the private key portion (which only the key holder should access) of a public/private key pair. Anyone with the sender's widely published public key can decrypt the signature and, by doing so, receive the assurance that the data must have come from the sender (non-repudiation of the sender) and that the data has not changed (integrity). The data that is encrypted with the private key is not the entire message, but a short, fixed-length block of data that is computed from the message using a so-called "hash" function.¹
 10. File transport: The transmittal of the contents of a collection of records (file) from point A to point B.
 11. File Transport Protocol (FTP): A Transmission Control Protocol/Internet Protocol (TCP/IP) standard used to log onto a network, list directories and copy files. FTP authenticates users and allows them to transfer files, list directories, delete and rename files on a remote host, and perform wild-card transfers.¹
 12. Hash: A primitive mathematical method used to ensure that what was sent was received by creating a number via a formula that corresponds to various elements in the file. This will be compared to a number generated by that same formula once the file is received.
 13. Non-repudiation: Ensuring transactions / activities are binding and meaningful (one cannot subsequently deny having performed an activity).
 14. PGP: Public-key encryption software sold by Network Associates. PGP began as an open standard for message encryption. Add-ons are available for a number of desktop products. The underlying protocol has been designated a military weapon by the United States and some other countries in an effort to regulate its distribution, but similar software is widely available on the Internet.¹

¹ Gartner, Inc. -- http://www.gartner.com/6_help/glossary/GlossaryMain.jsp



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15. Request for Comment (RFC): A document submitted for comment and put through a review process under the auspices of the Internet Engineering Task Force (IETF). When accepted, it has the weight of a standard in the Internet community. Each RFC is given a tracking number. For example, RFC 822 describes the address format and data definitions for addressing electronic messages over the Internet, while RFC 1490 is a standard specification for encapsulating multiple protocols over a wide-area frame relay network.¹
16. Secure Copy (SCP): http://en.wikipedia.org/wiki/Secure_copy
17. Secure File Transport: The transmittal of data from one computer to another while it is encrypted.
18. Secure file transfer protocol (SFTP): http://en.wikipedia.org/wiki/SSH_file_transfer_protocol
19. Secure Shell (SSH): http://en.wikipedia.org/wiki/Secure_Shell
20. Secure Sockets Layer (SSL): An Internet security standard developed by Netscape Communications. SSL offers session-level security — that is, after a secure session has been initiated, all information transmitted over the Internet during that session is encrypted. SSL also offers features such as server and client authentication as well as message integrity.¹
21. Symmetric Key Encryption: In symmetric key encryption, the sender and receiver share a "secret" key. Using this key, a file can be encrypted into scrambled text. Using symmetric key encryption, eavesdropping no longer is a problem (unless the eavesdropper knows what the secret key is). It also becomes harder for someone to modify file in transit in any kind of a meaningful way. The problem with symmetric key encryption is precisely the fact that the sender and receiver must share the same secret key
22. Transport Layer Security (TLS): A protocol designed to secure the privacy of communications over the Internet. It is defined in request for comment 2246 from the Internet Engineering Task Force.¹

B. Declarations

1. The tools (encryption systems, secure file transport managers, etc.) chosen must be compatible with the diverse environment of the State's IT infrastructure. Either encrypt the pipe (network transport) or the files/data being transported.
2. When authentication is needed to transport files, the authentication must be secure.

These standards are adopted by the Department of Technology and Information (DTI), through the Technology and Architecture Standards Committee (TASC), and are applicable to all Information Technology use throughout the State of Delaware. Any questions or comments should be directed to dti_tasc@state.de.us



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V. Definitions of Ratings

Individual components within a Standard will be rated in one of the following categories.

COMPONENT RATING	USAGE NOTES
STANDARD – DTI offers internal support and/or has arranged for external vendor support as well (where applicable). DTI believes the component is robust and can be expected to enjoy a useful life of 3+ years from the Effective Date.	These components can be used without explicit DTI approval for both new projects and enhancement of existing systems.
DECLINING – Deprecated - DTI considers the component to be a likely candidate to have support discontinued in the near future. A deprecated element is one becoming invalid or obsolete.	Via the State's waiver process, these components must be explicitly approved by DTI for all projects . They must not be used for minor enhancement and system maintenance without explicit DTI approval via the State's waiver process.
DISALLOWED – DTI declares the component to be unacceptable for use and will actively intervene to disallow its use when discovered.	No waiver requests for new solutions with this component rating will be considered.

- A. Missing Components** – No conclusions should be inferred if a specific component is not listed. Instead, contact the TASC to obtain further information.



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VI. Component Assessments

- A. If the Business Manager (who is the Steward of the data) determines that the data should be encrypted, the Systems Administrators, Network Administrators, Computer Auditors, and Application Development personnel, Project Leaders, and Third Party Software Providers are responsible for ensuring that the entire structure of the environment housing this data is secure. For further information please consult the [State of Delaware Information Security Policy](#). For an aid in determining a reasonable level of data security please consult the [Data Classification Policy](#).
- B. The chosen encryption method must comply with the State's standards.
- C. The industry is fluctuating between standards bodies and vendor offerings. Data security, however, cannot be ignored while these technologies catch up to business needs. Therefore, this standard will be re-visited every year. It is our intention to select appropriate software products and enter into enterprise-wide licensing agreements when the industry has matured and the funding is available.
- D. The current states of the vendor products appear to have one thing in common: interoperability problems. No 'Standard' cited below should be taken as acceptable in your environment without a thorough test by you of the product to ensure it can work in your environment.
- E. State organizations may continue to use their current encryption software as long as it meets the standards outlined by the State and it meets industry requirements for security, privacy and password protection. It must also be compatible with the State approved encryption methods. However, State organizations that do not currently have software and are not in compliance with all Federal Regulations and State Attorney General Rulings or opinions for the transmitting of personally identifiable State Employee information, will need to purchase a package that is from the list of State approved encryption methods.

These standards are adopted by the Department of Technology and Information (DTI), through the Technology and Architecture Standards Committee (TASC), and are applicable to all Information Technology use throughout the State of Delaware. Any questions or comments should be directed to dti_tasc@state.de.us.



Encryption algorithms used during file transports

Component	Rating	Comments
AES – 256 bit encryption	Standard	Appropriate for data classified as 'Top Secret'
AES – 128 bit encryption	Standard	
Triple DES	Disallowed	
DES	Disallowed	
The above are minimum encryption levels accepted by the State of Delaware. Increasing the level of encryption is preferred as the level of data classification increases but can be limited by the systems resources.		

File Transport

Component	Rating	Comments
SSH-2 (SFTP, SCP)	Standard	It must conform to RFC 4251 – The Secure Shell (SSH) Protocol Architecture (see http://tools.ietf.org/html/rfc4251) Configure all servers to accept SSH-2
TLS (SSL)	Standard	It must conform to RFC 5246 – The Transport Layer Security (TLS) Protocol V 1.2 (see http://tools.ietf.org/html/rfc5246)
FTPS (Explicit Mode)	Standard	
FTP	Disallowed	
FTP/PGP	Disallowed	
SSH-1	Disallowed	Configure all servers to accept SSH-2



STATE OF DELAWARE
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 801 Silver Lake Blvd.
 Dover, Delaware 19904

Doc Ref Number:	SE-CLD-001	Revision Number:	5
Document Type:	Enterprise Policy	Page:	1 of 4
Policy Title:	Cloud and Offsite Hosting Policy		

Synopsis:	This policy provides a way for State of Delaware organizations to utilize offsite hosting facilities including cloud computing (Software as a Service, etc.)		
Authority:	Title 29, Delaware Code, §9004C - General powers, duties and functions of DTI "2) Implement statewide and interagency technology solutions, policies, standards and guidelines as recommended by the Technology Investment Council on an ongoing basis and the CIO, including, but not limited to, statewide technology and information architectures, statewide information technology plans, development life cycle methodologies, transport facilities, communications protocols, data and information sharing considerations, the technique of obtaining grants involving the State's informational resources and the overall coordination of information technology efforts undertaken by and between the various State agencies;"		
Applicability:	This Policy is applicable to all users of the State of Delaware communications and computing resources. DTI is an Executive Branch Agency and has no authority over the customers in Legislative and Judicial Branches, as well as School Districts, and other Federal and Local Government entities that use these resources. However, all users, including these entities, must agree to abide by all policies, standards promulgated by DTI as a condition of access and continued use of these resources.		
Effective Date:	5/15/2013	Expiration Date:	None
POC for Changes:	Elayne Starkey, Chief Security Officer		
Approval By:	James Collins, Chief Information Officer		
Approved On:	11/30/2015		



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I. Policy

EXECUTIVE SUMMARY

Cloud and offsite hosting offer a credible alternative to traditional IT delivery models. Cloud and offsite hosting can provide benefits such as rapid delivery, enhanced scalability, agility and new funding models.

PURPOSE

This policy establishes the terms and conditions for cloud or offsite hosting services. All IT-related RFPs, Contracts, etc. must abide by this policy. These technical terms and conditions will help to protect the State's organizations by mitigating the risks associated with entrusting the State's data to a third party. [The Center for Digital Government 2014 study of Cloud Security Procurements](#) endorsed the Delaware T&Cs as the starting point for their discussion.

POLICY STATEMENT

New contracts and amendments are expected to include this vendor-signed document approved by DTI. Contracts already in force will be expected to include this vendor-signed document approved by DTI at the next renewal date. The terms and conditions clauses are mandatory for every engagement and exceptions will be considered non-compliant and non-responsive. These terms and conditions are located at



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- [PDF version of the State’s Terms and Conditions - Public data](#)
- [PDF version of the State’s Terms and Conditions - Non Public data](#)

CYBER SECURITY LIABILITY INSURANCE

Protection of sensitive Personally Identifiable Information (PII) or otherwise confidential information is paramount to the State of Delaware. Data such as social security number, date of birth, driver’s license number, financial data, and federal/state tax information shall be encrypted at rest with validated cryptography standards as specified in National Institute of Standards and Technology [FIPS140-2](#) Security Requirements. When the Service Provider cannot offer encryption at rest, they must maintain, for the duration of the contract, cyber security liability insurance coverage for any loss resulting from a data breach. The policy shall comply with the following requirements:

- Issued by an insurance company acceptable to the State of Delaware and valid for the entire term of the contract, inclusive of any term extension(s).
- Liability limits will be calculated based on the maximum system record count and the [Ponemon Institute](#) average Public Sector Breach cost per record (currently \$154). Refer to the Tiered Coverage Schedule below.

Tiered Coverage Schedule

Level	Number of PII records	Level of cyber liability insurance required (occurrence = data breach)
1	1-10,000	\$2,000,000 per occurrence
2	10,001 – 50,000	\$3,000,000 per occurrence
3	50,001 – 100,000	\$4,000,000 per occurrence
4	100,001 – 500,000	\$15,000,000 per occurrence
5	500,001 – 1,000,000	\$30,000,000 per occurrence
6	1,000,001 – 10,000,000	\$100,000,000 per occurrence

- Shall include, but not be limited to, coverage for liabilities arising out of premises, operations, independent contractors, products, completed operations, and liability assumed under an insured contract.
- At a minimum, the policy must include third party coverage for credit monitoring; notification costs to data breach victims; and regulatory penalties and fines.



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- Shall apply separately to each insured against whom claim is made or suit is brought subject to the Service Provider's limit of liability.
- Shall include a provision requiring that the policy cannot be cancelled without thirty days written notice to the State Chief Information Officer
- The Service Provider shall be responsible for any deductible or self-insured retention contained in the insurance policy,
- The coverage under the policy shall be primary, and not excess, to any other insurance carried by the Service Provider.
- In the event contractor fails to keep in effect at all times the insurance coverage required by this provision, the State may, in addition to any other remedies it may have, terminate the contract upon the occurrence of such event, subject to the provisions of the contract.

IMPLEMENTATION RESPONSIBILITY

DTI and/or the organization's technical staff will implement this policy during the course of normal business activities, including project execution and the design, development, or support of systems.

Cloud service providers shall be familiar with, and closely aligned to, the State Standards and Policies related to security. These are referenced in relation to all in-house application builds. Each cloud service provider may have their own means of meeting various security challenges, but each cloud service provider/platform must cover these requirements:

- [Strong Password Standard](#)
- [Web Application Security Standard](#)
- [Common Look and Feel](#) for public facing applications
- [Delaware Information Security Policy](#)

ENFORCEMENT and WAIVER

DTI will enforce this policy during the course of normal business activities, including review of proposed projects and during the design, development, or support of systems. This policy may also be enforced by others during the course of their normal business activities, including audits and design reviews.

If there is ambiguity or confusion regarding any part of this policy, contact the point of contact defined in the header of this policy.



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II. Definitions

Personally Identifiable Information

1. Information or data, alone or in combination, that identifies or authenticates a particular individual. Such information or data may include, without limitation, Name, Date of birth, Full address (e.g. house number, city, state, and/or zip code), Phone Number, Passwords, PINs, Federal or state tax information, Biometric data, Unique identification numbers (e.g. driver's license number, social security number, credit or debit account numbers, medical records numbers), Criminal history, Citizenship status, Medical information, Financial Information, Usernames, Answers to security questions or other personal identifiers.
2. Information or data that meets the definition ascribed to the term "Personal Information" under 6 Del. C. § 12B-102 of Delaware Code or any other applicable law of the State of Delaware

III. Development and Revision History

Initial version established **5/15/2013**

First revision established **8/27/2014**

Second revision establish **11/17/2014**

Third revision established **11/23/2015:**

Removed language regarding the State's inclusion on the insured list.

Fourth revision established **03/01/2016:**

Added Tiered Coverage Schedule. Added PII definition. Adjusted Ponemon value. Updated link for The Center for Digital Government 2014 study of Cloud Security Procurements.

Fifth revision established **10/10/2016:**

Added language and references to State standards in the Implementation Responsibility section.



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V. Approval Signature Block

Name & Title: James Collins State Chief Information Officer	Date: 10/10/2016

VI. Listing of Appendices

PDF version of the State's Terms and Conditions - Public data
PDF version of the State's Terms and Conditions - Non public data
21 Steps to the Cloud



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