Windows 7 Security

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Windows Core OS Security Development

Microsoft

Windows Vista Security

Windows Vista introduced numerous security and defense-in-depth features:

- Build based on SDL
- Address Space Layout Randomization (ASLR)
- Data Execution Prevention (DEP)
- Protected Processes
- Authentication Infrastructure enhancements (incl. smart cards)
- User Account Control (UAC)
- Full Volume Encryption (BitLocker)
- Secure Boot (BitLocker/TPM)
- Code Integrity, Code Signing, Crypto enhancements
- Software Restriction Policy (SRP)
- Advanced Audit Policies
- and much more.....

Windows 7 Security

Builds upon the proven security lineage of Vista, retaining the **multiple layers of defense**

Responds to requests from IT professionals to make the security features **more usable and manageable**

Delivers **new security features** to help IT professionals more effectively address the continually evolving threat landscape

Engineering Excellence

Windows Development Process

- Security Development Lifecycle (SDL)
  - Periodic mandatory security training
  - Assignment of security advisors for *all* components
  - Threat modeling as part of design phase
  - Security reviews and testing built into the schedule
  - Security metrics for product teams
- Common Criteria (CC) Certification compliance is one of major goals

Data Encryption Enhancements

Windows Vista BitLocker

- Full volume encryption for system disks
- Integrity checking of early boot components

Windows 7 Enhancements

- BitLocker deployment improvements
- Key Management Improvements (Data Recovery Agent)
- Support for FAT and ExFAT formatted volumes
- BitLocker To Go – policy-enforced data protection for USB and portable drives

Customer Value

- Easier to configure and deploy BitLocker
- Roam protected data between work and home
- Share protected data with co-workers, clients, partners, etc.
- Improved compliance and data security

AppLocker™ - Software Lockdown

Software Restriction Policies – XP / Vista

- Hash-based rules for allow-to-run applications
- Hash rules too fragile for IT to manage and keep up to date

Windows 7 Capabilities

- Simple, powerful policies for which applications can run
- Rule sets for executables, scripts, and Windows Installer
- Publisher rules may utilize product name, file name & file version
- Rules can have built-in exceptions, simplifying rule sets
- Policy export/import capabilities allows for easier administration

Improved Legal and Regulatory Compliance

- Enables application standardization within an organization without increasing TCO
- Increase security to safeguard against data and privacy loss
- Support compliance enforcement

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AppLocker™ Example Rules

Publisher

- *"Allow Art-Dept to run Adobe Photoshop 10.2 or greater"*

Publisher w/ Exception

- *"Allow Everyone to run Windows OS7 except Regedt32 etc*

Hash

- *"Allow unsigned per-user app with hash XYZ"*

Path

- *"Allow Everyone to run scripts from \\scriptserver\share"*

UAC Improvements

Windows Vista User Account Control

- Make the system work well for standard users
- Common user tasks redesigned to work for Standard User
- All users run as Standard User by default even when you log on as admin
- Administrators use full privilege only for administrative tasks or applications
- User provides explicit consent before using elevated privilege

Windows 7

- Reduce the number of OS applications and tasks that require elevation
- Refactor applications into elevated/non-elevated pieces
- User control over UAC settings – similar to IE “zones”

Customer Value

- Users can do even more as a standard user
- Administrators will see fewer UAC Elevation Prompts

Advanced Audit Policy Creation & Reporting

Windows Vista

- All new in Windows Vista
- Fine grain support for multiple audit categories

Windows 7 Enhancements

- Group Policy support for fine grain audit capabilities
- Include why a user has access to an object
  - List of ACE or privileges that resulted in gaining access
- Capture the reason why a user received access denied
  - ACL, integrity level or lack of permission
- Simplified management of “track all changes made by group X”
  - Global System Access Control Lists

Customer Value

- Demonstrate why a person has access to specific information
- Easier to manage resulting in lower TCO

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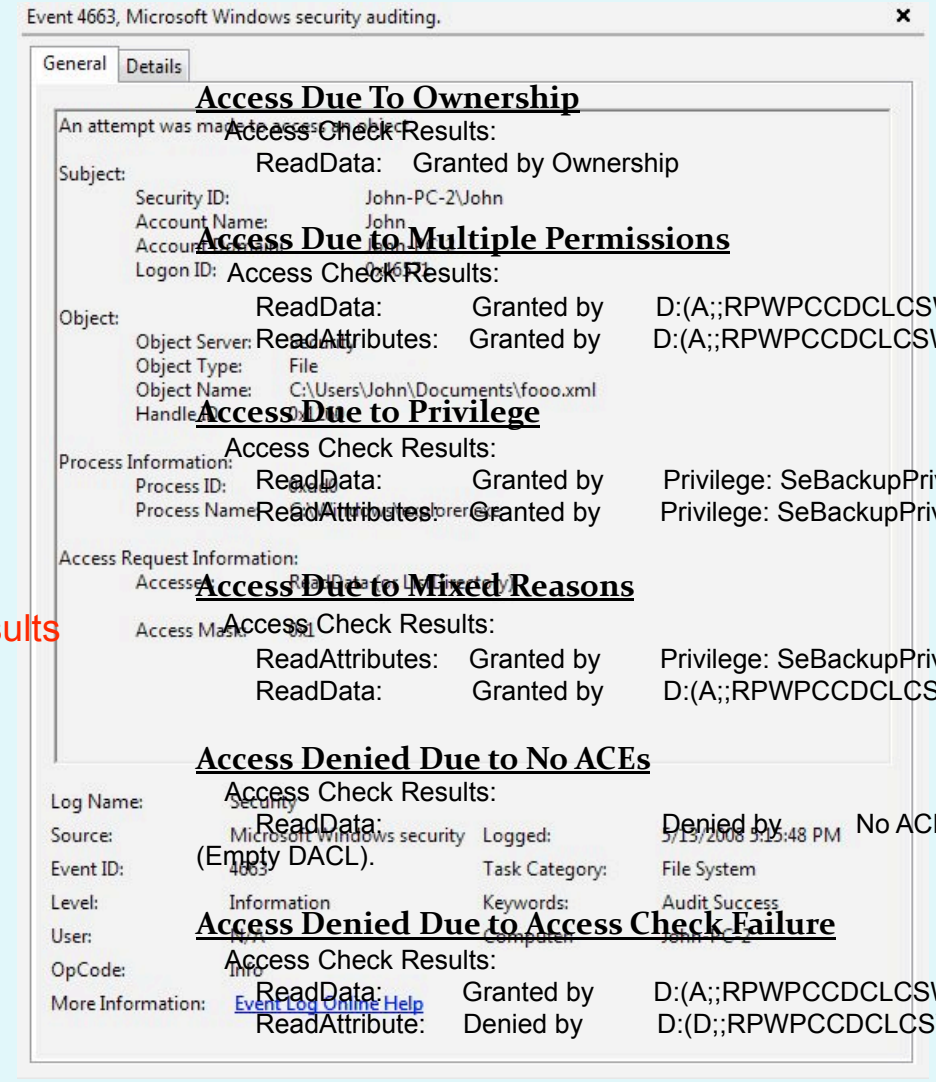
Object Access Reason Information

New Access Check Results



Access Due To Ownership

Access Check Results:

ReadData: Granted by Ownership

Access Due to Multiple Permissions

Access Check Results:

ReadData: Granted by D:(A;;RPWPCCDCLCSWRCWDWOGA;;;REDMOND\Everyone)

ReadAttributes: Granted by D:(A;;RPWPCCDCLCSWRCWDWOGA;;;REDMOND\john)

Access Due to Privilege

Access Check Results:

ReadData: Granted by Privilege: SeBackupPrivilege.

ReadAttributes: Granted by Privilege: SeBackupPrivilege.

Access Due to Mixed Reasons

Access Check Results:

ReadAttributes: Granted by Privilege: SeBackupPrivilege.

ReadData: Granted by D:(A;;RPWPCCDCLCSWRCWDWOGA;;;REDMOND\Everyone)

Access Denied Due to No ACEs

Access Check Results:

ReadData: Denied by No ACEs granting access to this resource (Empty DACL).

Access Denied Due to Access Check Failure

Access Check Results:

ReadData: Granted by D:(A;;RPWPCCDCLCSWRCWDWOGA;;;REDMOND\Everyone)

ReadAttribute: Denied by D:(D;;RPWPCCDCLCSWRCWDWOGA;;;REDMOND\Everyone)

Cryptography

- Support for NSA Suite B
  - **Encryption:** AES
    - FIPS 197 (with keys sizes of 128 and 256 bits)
  - **Digital Signature:** Elliptic Curve Digital Signature Algorithm
    - FIPS 186-2 (using the curves with 256 and 384-bit prime moduli)
  - **Key Exchange:** Elliptic Curve Diffie-Hellman or Elliptic Curve MQV
    - Draft NIST Publication 800-56 (curves with 256 and 384-bit prime moduli)
  - **Hashing:** Secure Hash Algorithm
    - FIPS 180-2 (using SHA-256 and SHA-384)
- Improved Pseudo Random Number Generator (PRNG)

Smartcards

Windows 7 Focus: Remove deployment blockers, improve usability and performance

- Smart card Plug-and-Play
  - Windows Update and SUS based driver installation
  - Pre-Logon driver installation
  - Non-Admin based driver installation
- Smart card class mini-driver
  - NIST SP800-73-1 (PIV) support
  - INCITS GICS (Butterfly) support
- Windows 7 Smartcard Framework Improvements
  - Improved support for Biometric Based Smart card unlock
  - Improved certification program
  - New APIs enabling Secure Key Injection
- Improved platform support for “Smart card require” scenarios

Public Key Infrastructure

- New web services based protocol for certificate enrollment
- Cross-forest certificate enrollment
- Improved support for NAP scenarios
- Improved user experience for certificate selection
- Support for Transport Layer Security (TLS) 1.2
- General architectural and performance improvements
- Improved support for certificate and smart card logon scenarios

Biometrics

Windows Vista

- No common biometrics framework
- Varied management and user experience with OEM/ISV bio components

Windows 7 Enhancements

- New platform/framework for Biometric Devices Drivers
- Partners bringing additional enterprise scenarios
- New driver model and basis for future certification program
- Integrated User Experience - Windows Logon, Local and Domain, UAC
- Enterprise Management: Disable Biometric via Group Policy, Allow use for applications but not domain logon

Kerberos

- ECC-based Smartcard domain logon
- Authentication mechanism (i.e. Smart card) addition to the token
- Access policy based on authentication mechanism
- Channel-binding token (CBT) – integration with the policy
- Forest search with short names
- Configurable selection of the encryption algorithm
- New account mapping for S4U

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