Entrust identityguard 12 administration guide

1 Entrust Entrust IdentityGuard 8.1 Deployment Guide Document issue: 2.0 Date of Issue: April 2007 2 Copyright 2007 Entrust. All rights reserved. Entrust is a trademark or a registered trademark of Entrust, Inc. in certain countries. All Entrust product names and logos are trademarks or registered trademarks of Entrust, Inc. in certain countries. All other company and product names and logos are trademarks or registered trademarks of their respective owners in certain countries. This information is subject to change as Entrust reserves the right to, without notice, make changes to its products as progress in engineering or manufacturing methods or circumstances may warrant. Export and/or import of cryptographic products may be restricted by various regulations in various countries. Export and/or import permits may be required. 2 Entrust IdentityGuard 8.1 Deployment Guide 3 Table of contents *About this guide Revision information Documentation conventions Note and Attention text Related documentation Obtaining documentation Documentation feedback Obtaining technical assistance Technical support Telephone numbers address Professional Services CHAPTER 1 About Entrust IdentityGuard Why use Entrust IdentityGuard? Challenges of single-factor authentication Benefits of multilayer authentication Entrust IdentityGuard users Entrust IdentityGuard components Entrust IdentityGuard Server Repository First-factor authentication application Entrust IdentityGuard Radius proxy Entrust IdentityGuard Desktop for Microsoft Windows Entrust IdentityGuard Remote Access Plug-in 4 CHAPTER 2 Authentication choices Overview of available authentication methods Authentication choices for users Token authentication Entrust tokens Other tokens Grid authentication Passcode lists Knowledge-based authentication Sources of questions Creating good questions Ensuring answer consistency Selecting a set of questions Out-of-band authentication Machine authentication Sources of machine information Authentication choices for deploying organizations Grid serial number or grid location replay Image and message replay Temporary PIN authentication External authentication CHAPTER 3 Planning your deployment Planning: initial considerations Entrust IdentityGuard policies People Operations Backup and recovery Other precautions Planning administrative tasks Assigning master users Assigning administrators Entrust IdentityGuard 8.1 Deployment Guide Document issue: 2.0 5 Planning end user requirements Alias and user ID requirements Aliases in a consumer deployment Locking out users Training end users Providing services to end users Group requirements Groups in a consumer deployment Groups in an enterprise deployment Analyzing your company s group needs Group implementation CHAPTER 4 Deployment considerations Application integration Web integration Microsoft Windows integration VPN remote access integration Application considerations Integrating with existing user management systems Using shared secrets Performance testing strategies High availability and disaster recovery Directory failover Local Directory failover Geographically dispersed Directory failover Database failover Radius server failover Migrating to Entrust IdentityGuard CHAPTER 5 Deploying grid authentication Grid requirements Grid size and format Grid lifetime and replacement 6 Challenge requirements Challenge length Challenge size Challenge algorithm Grid production models Produce-and-assign model Produce-and-assign grids for existing users Produce-and-assign grids for new users Preproduction model Physical card security Physical card production options In-house card production Typical characteristics Setup Process Outsourced card production Typical Characteristics Setup Process Entrust IdentityGuard card production Typical characteristics Setup Card production cost factors Secure file transmission Automating processes CHAPTER 6 Deploying token authentication Using tokens for authentication Token lifetime and replacement Token PINs Token deployment Assigning tokens Token self-registration Physical token security Entrust IdentityGuard 8.1 Deployment Guide Document issue: 2.0 7 APPENDIX A User life cycle management Life cycle management overview Enrolment Usage Renewal Replacement Delivery and activation Maintenance APPENDIX B Entrust IdentityGuard baseline architectures Architecture overview Evaluation Standard High availability Web access Web access - evaluation Requirements Available Entrust IdentityGuard authentication methods Web access - standard Requirements Available Entrust IdentityGuard authentication methods Web access - high availability Requirements Available Entrust IdentityGuard authentication methods VPN remote access VPN remote access - evaluation Requirements Available Entrust IdentityGuard authentication methods VPN remote access - standard Requirements Available Entrust IdentityGuard authentication methods VPN remote access - high availability Requirements 8 Available Entrust IdentityGuard authentication methods Microsoft Windows remote access Microsoft Windows remote access - evaluation Requirements Available Entrust IdentityGuard authentication methods Microsoft Windows remote access - standard Requirements Available Entrust IdentityGuard authentication methods Microsoft Windows remote access - high availability Requirements Available Entrust IdentityGuard authentication methods Microsoft Windows desktop Microsoft Windows desktop - evaluation Requirements Available Entrust IdentityGuard authentication methods Microsoft Windows desktop - standard Requirements Available Entrust IdentityGuard authentication methods Microsoft Windows desktop - high availability Requirements Available Entrust IdentityGuard authentication methods APPENDIX C Card usability study Entrust IdentityGuard card usability study Usability test summary Objective Methodology Usability test results Recommendations General guidelines Card design and layout Fonts Use of color Design of the grid Entrust IdentityGuard 8.1 Deployment Guide Document issue: 2.0 9 Grid authentication implementation Web login challenge method Mutual authentication (through displaying a authentication secret) Temporary PIN length Index 10 10 Entrust IdentityGuard 8.1 Deployment Guide Document issue: 2.0 11 *About this guide This guide discusses how to deploy Entrust IdentityGuard in an enterprise or consumer environment. Note: The guide is not intended to be an exhaustive list of all the activities and tasks required to deploy Entrust IdentityGuard. It acts as a guide for the team responsible for deployment. Topics in this chapter: Revision information on page 13 Documentation conventions on page 14 Related documentation on page 15 Obtaining documentation on page 16 Obtaining technical assistance on page 17 This guide contains the following sections: About Entrust IdentityGuard on page 19 describes Entrust IdentityGuard and what it does. Authentication choices on page 27 describes and compares the authentication methods and how to deploy them. Planning your deployment on page 57 describes Entrust IdentityGuard deployment planning considerations. Deployment considerations on page 73 describes how to integrate Entrust IdentityGuard into your existing applications. Deploying grid authentication on page 87 describes, in detail, how to deploy grid authentication. Deploying token authentication on page 109 describes, how to deploy token authentication. User life cycle management on page 113 describes the life cycle for an Entrust IdentityGuard user. 11 12 Entrust IdentityGuard baseline architectures on page 123 describes various architectures for deploying Entrust IdentityGuard. Card usability study on page 145 describes a study completed to examine card usability aspects. 12 Entrust IdentityGuard 8.1 Deployment Guide Document issue: 2.0 13 Revision information The following sections include updated information. Table 1: Revisions in this document Revision Section Description Document issue 2.0 Token authentication on page 31 Using tokens for authentication on page 110 Updates the information on token authentication. *About this guide 13 14 Documentation conventions Following are typographic conventions which appear in this guide: Table 2: Typographic conventions Convention Purpose Example Bold text (other than headings) Italicized text Blue text Underlined blue text Courier type Angle brackets < > Square brackets [courier type] Indicates graphical user interface elements and wizards Used for book or document titles Used for hyperlinks to other sections in the document Used for Web links Indicates installation paths, file names, Windows registry keys, commands, and text you must enter Indicates variables (text you must replace with your organization s correct values) Indicates optional parameters Click Next. Entrust TruePass 7.0 Deployment Guide Entrust TruePass supports the use of many types of digital ID. For more information, visit our Web site at Use the entrust-configuration.xml file to change certain options for Verification Server. By default, the entrust.ini file is located in /conf/security/entrust. ini. dsa passwd [-ldap] Note and Attention text Throughout this guide, there are paragraphs set off by ruled lines above and below the text. These paragraphs provide key information with two levels of importance, as shown below. Note: Information to help you maximize the benefits of your Entrust product. Attention: Issues that, if ignored, may seriously affect performance, security, or the operation of your Entrust product. 14 Entrust IdentityGuard 8.1 Deployment Guide Document issue: 2.0 15 Related documentation Entrust IdentityGuard is supported by a complete documentation suite: For instructions on installing and configuring Entrust IdentityGuard Server, see the Entrust IdentityGuard Installation Guide. For instructions on administering Entrust IdentityGuard users and groups, see the Entrust IdentityGuard Administration Guide. For information on deploying Entrust IdentityGuard, refer to the Entrust IdentityGuard Deployment Guide. For information on configuring Entrust IdentityGuard to work with a supported LDAP repository Microsoft Active Directory, Microsoft Active Directory Application Mode, Critical Path InJoin Directory, IBM Tivoli Directory, Novell edirectory, or Sun ONE Directory see the Entrust IdentityGuard Directory Configuration Guide. For information on configuring Entrust IdentityGuard to work with a supported database IBM DB2 Universal Database, Microsoft SQL Server, or Oracle Database see the Entrust IdentityGuard Database Configuration Guide. For information on Entrust IdentityGuard error messages, see the Entrust IdentityGuard Error Messages. For information on new features, limitations and known issues in the latest release, see the Entrust IdentityGuard Release Notes. For information on integrating the authentication and administration processes of your applications with Entrust IdentityGuard, see the Entrust IdentityGuard Programming Guide that applies to your development platform (either Java Platform or C#). For Entrust IdentityGuard product information and a data sheet, go to For information on identity theft protection seminars, go to *About this guide 15 16 Obtaining documentation Entrust product documentation, white papers, technical notes, and a comprehensive Knowledge Base are available through Entrust TrustedCare Online. If you are registered for our support programs, you can use our Web-based Entrust TrustedCare Online support services at: Documentation feedback You can rate and provide feedback about Entrust product documentation by completing the online feedback form. You can access this form by clicking the link located in the footer of Entrust s PDF documents (see bottom of this page). following this link: Feedback concerning documentation can also be directed to the Customer Support address. 16 Entrust IdentityGuard 8.1 Deployment Guide Document issue: 2.0 17 Obtaining technical assistance Entrust recognizes the importance of providing quick and easy access to our support resources. The following subsections provide details about the technical support and professional services available to you. Technical support Entrust offers a variety of technical support programs to help you keep Entrust products up and running. To learn more about the full range of Entrust technical support services, visit our Web site at: If you are registered for our support programs, you can use our Web-based support services. Entrust TrustedCare Online offers technical resources including Entrust product documentation, white papers and technical notes, and a comprehensive Knowledge Base at: If you contact Entrust Customer Support, please provide as much of the following information as possible: your contact information product name, version, and operating system information your deployment scenario description of the problem copy of log files containing error messages description of conditions under which the error occurred description of troubleshooting activities you have already performed Telephone numbers For support assistance by telephone call one of the numbers below: in North America outside North America address The address for Customer Support is: *About this guide 17 18 Professional Services The Entrust team assists e-businesses around the world to deploy and maintain secure transactions and communications with their partners, customers, suppliers and employees. We offer a full range of professional services to deploy our e-business solutions successfully for wired and wireless networks, including planning and design, installation, system integration, deployment support, and custom software development. Whether you choose to operate your Entrust solution in-house or subscribe to hosted services, Entrust Professional Services will design and implement the right solution for your e-business needs. For more information about Entrust Professional Services please visit our Web site at: 18 Entrust IdentityGuard 8.1 Deployment Guide Document issue: 2.0 19 Chapter 1 About Entrust IdentityGuard Entrust IdentityGuard is a multifactor authentication product that enhances the security and verifiability provided by a first-factor authentication system. It allows end users to prove their identity when accessing sensitive resources from their Microsoft Windows desktop, remotely through a VPN connection, or over the Web. This chapter includes the following sections: Why use Entrust IdentityGuard? on page 20 Entrust IdentityGuard users on page 22 Entrust IdentityGuard components on page 23 19 20 Why use Entrust IdentityGuard? As online fraud and compliance regulations become more prevalent, standard user name and password authentication no longer offers sufficient security to your organization s sensitive resources. Strong authentication is a tool that your organization likely uses in some form today. Whether it is for VPN remote access, Microsoft Windows security, or Web-based applications, you need to provide strong and flexible authentication to a wide range of users and transactions, based on the risk associated with those transactions. Entrust IdentityGuard provides multiple authentication factors (also referred to as methods) which your organization can add to its initial user name and password authentication methods to increase security. The various authentication methods Entrust IdentityGuard offers allows you to adjust the strength of the authentication to the sensitivity of the resource or transaction. For example, as the following diagram demonstrates, a company could add Entrust IdentityGuard grid authentication to the user name and password authentication when a remote employee logs in using a VPN connection. User name and password authentication resource End user that requires multifactor authentication Company VPN device Entrust IdentityGuard Server Company firewall Employee repository Topics in this section: Challenges of single-factor authentication on page 21 Benefits of multilayer authentication on page Entrust IdentityGuard 8.1 Deployment Guide Document issue: 2.0 21 Challenges of single-factor authentication Authentication is the process of determining whether someone or something is, in fact, who or what it presents itself as. In private and public computer networks, authentication is commonly done through the use of a user name and password. The user enters their password to authenticate to the application. This method is referred to as single-factor authentication. However, the rapid increase in online identity theft shows that user names and passwords alone which are easy to steal and easy to reuse are not much defense against the ever-increasing sophistication of identity attacks. You need one or more second-factor authentication methods. Benefits of multilayer authentication Multilayer authentication is a solution that adds as many authentication methods as required based on the security context. For example, you can require an employee to log in using a user name and password, a grid challenge, and at the same time, have the authentication application check the computer they are using to ensure it is registered. By adding multiple layers of authentication, an organization accomplished two things: Identities become difficult to steal. With multifactor authentication, it is difficult, if not impossible, for an attacker to steal login data in large numbers. While it is possible to physically steal some authentication data on an individual basis, attackers are usually interested in mass theft. They will get frustrated by the effort. Also, an organization can authenticate itself to its users, making it easier for users to detect redirection to a fraudulent site. The user can then take immediate countermeasures against the likely theft. Stolen identities become difficult to reuse. Your organization can combine multiple authentication factors in ways that make the theft of a single factor useless to the attacker. Without the additional authentication factors, the attacker has either no access to a user s confidential information or can only view trivial information. Also, authentication can be performed at the transaction level making use of different authentication factors depending on the risk associated with the transaction. About Entrust IdentityGuard 21 22 Entrust IdentityGuard users Entrust IdentityGuard users are divided into different categories, based on how they access your organization s resources. See Entrust IdentityGuard baseline architectures on page 123 for diagrams on how Entrust IdentityGuard interacts with these users. The user categories are: Microsoft Windows desktop users These are internal users who, after logging in to your domain using their Windows user name and password, are then challenged for a second factor of authentication (grid authentication). For more information on these users, refer to the Entrust IdentityGuard Desktop Client for Microsoft Windows Administration Guide. Routing and Remote Access Service (RRAS) users These are Microsoft Windows users internal to your organization who access your domain remotely through a dial-up, wireless, or VPN connection and use the Microsoft Routing and Remote Access Service. After logging in to your domain, they are then challenged for a second factor of authentication (grid authentication). For more information on these users, refer to the Entrust IdentityGuard Desktop Client for Microsoft Windows Administration Guide. VPN users These are internal or external users who log into your domain using a VPN connection. The first-factor of authentication (usually a user name and password) can be provided by an existing Remote Authentication Dial In User Service (Radius) server, or Entrust IdentityGuard can leverage Directory or Domain-based authentication information to complete the first-factor authentication itself. Entrust IdentityGuard then challenges these users for a second factor of authentication (either grid or token). For more information, refer to VPN remote access integration on page 75. Web users These are internal or external users to your organization who access your intranet or Internet site by logging in through a Web browser. The first-factor of authentication is completed by a Web access product, and Entrust IdentityGuard can then provide different multi-factor authentication methods as required by the sensitivity of the operation the user wishes to perform. For more information, refer to Web integration on page Entrust IdentityGuard 8.1 Deployment Guide Document issue: 2.0 23 Entrust IdentityGuard components The following diagram shows how Entrust IdentityGuard fits into your existing authentication system. The Entrust IdentityGuard Server and optional components are further described in this section. End user First-factor authentication application Entrust IdentityGuard Server Repository Topics in this section: Entrust IdentityGuard Server on page 23 Repository on page 24 First-factor authentication application on page 25 Entrust IdentityGuard Radius proxy on page 25 Entrust IdentityGuard Desktop for Microsoft Windows on page 25 Entrust IdentityGuard Remote Access Plug-in on page 26 Entrust IdentityGuard Server Entrust IdentityGuard Server is the main component of the Entrust IdentityGuard system. It includes the applications and interfaces required to authenticate and manage users and their authentication data: authentication and administration Web services with Java Platform and C# APIs administration interface and master command shell About Entrust IdentityGuard 23 24 sample Web application that demonstrates Entrust IdentityGuard s capabilities Repository Entrust IdentityGuard uses your existing repository to store user data. When a grid or other authentication data is generated for a user, sensitive data is written in encrypted form to the repository. During user authentication, data is retrieved from the repository. User data is stored in an existing LDAP-compliant Directory (including Active Directory) or a database. If you are using an LDAP-compliant Directory as your repository, consider the following: If your user population is split over multiple search bases in separate directories, you need to set up search bases in Entrust IdentityGuard. Entrust IdentityGuard has combined the support for user groups (see Group requirements on page 69) with support for multiple search bases. It can support multiple search bases for a single group and has the capability to use a single search base to cover multiple groups. Each search base has the capability of using a different Directory server and Directory user credentials. The default configuration uses a single search base. If you are using grid or token authentication, and will be pre-producing the grids or are loading the unassigned token information into the Entrust IdentityGuard system, this information is stored: as a flat file on the Entrust IdentityGuard Server (default) in a separate database, if storing over a 100,000 cards or tokens For more information on the file-based repository options, refer to the Entrust IdentityGuard Installation Guide. When the grid or token is assigned to a user, the information is then populated into their Directory entry. You can set up your repository in a failover scenario. For example: If you are using Active Directory or an LDAP-compliant Directory, you can add multiple URLs to the Entrust IdentityGuard property file. Entrust IdentityGuard will then attempt to connect to the directories in the order you have listed them. If you are using a database, you can set up automatic DNS updates, so that, should the primary database fail, the DNS entry of the database host changes to a secondary entry. This method requires database drivers that support automatic updates and disabling of Java network caching in Entrust IdentityGuard. For more information on failover, refer to High availability and disaster recovery on page Entrust IdentityGuard 8.1 Deployment Guide Document issue: 2.0 25 First-factor authentication application Entrust IdentityGuard integrates with your existing authentication application using the Entrust IdentityGuard authentication and administration Web services, which are used for retrieving challenge requests, authenticating user responses, and managing users and authentication data. This application can be a Radius server, a domain controller, a Web-based access control product, the Microsoft Windows Login feature, and so on. Depending on the type of application, you may need to customize it. For more information, see Deployment considerations on page 73. Entrust IdentityGuard Radius proxy The Entrust IdentityGuard Radius proxy component installs with the Entrust IdentityGuard Server to enable second-factor authentication (either grid or token) for VPN users. It intercepts messages between the VPN server and the first-factor authentication resource. That resource may be a Radius server, a Windows domain controller or an LDAP-compliant Directory. If the resource is a domain controller or Directory, you must use external authentication. For more information, see External authentication on page 56. Once your VPN server uses the Radius proxy for first-factor authentication, you can configure Entrust IdentityGuard to add second-factor authentication methods to the first-factor authentication performed by the Radius proxy. Entrust IdentityGuard Desktop for Microsoft Windows The purpose of the Entrust IdentityGuard Desktop for Microsoft Windows is to be a small-footprint client that communicates with the Entrust IdentityGuard Server. It provides strong second-factor authentication to the following: Windows Login - Microsoft Windows 2000 or Windows XP desktop (online or offline). The Windows Login feature of the Entrust IdentityGuard Desktop for Microsoft Windows allows users to use second-factor grid authentication when they log in to their Microsoft Windows desktop computer. Remote Access - Network access through dial-up, wireless, or Virtual Private Network (VPN) remote access. The Microsoft Routing and Remote Access Service (RRAS) feature enables users to remotely access a network through dial-up or VPN connectivity. When RRAS is installed on the Microsoft Windows desktop computer, a separate product called the Remote Access Plug-in for Microsoft Windows Server must be installed on a Microsoft Server machine. About Entrust IdentityGuard 25 26 Entrust IdentityGuard Desktop Manager is deployed using a Windows installer (.msi) file. You can customize the installer file by applying a transform (.mst file), which is a collection of changes applied to a base.msi file. A central administrator creates a custom installation file and configures the Entrust IdentityGuard options in accordance with your organization s policies and practices. Refer to the Entrust IdentityGuard Desktop for Microsoft Windows Administration Guide for more information. Entrust IdentityGuard Remote Access Plug-in The Entrust IdentityGuard Remote Access Plug-in for Microsoft Windows Server communicates with the Entrust IdentityGuard Desktop for Microsoft Windows Remote Access feature. For the Remote Access feature to connect to a Remote Access Server, the Entrust IdentityGuard Remote Access Plug-in for Microsoft Windows Server must be installed on one of the following supported servers: Microsoft Routing and Remote Access Service (RRAS) Microsoft Internet Authentication Service (IAS) Usually, the RRAS and IAS are on the same computer. If your setup requires these to be on separate computers, it is recommended you install the Remote Access Plug-in on the computer hosting the IAS. When the Remote Access Plug-in for Microsoft Windows Server is installed, an Entrust IdentityGuard Desktop for Microsoft Windows Remote Access client has the ability to connect to the Entrust IdentityGuard Server for user authentication. Refer to the Entrust IdentityGuard Desktop for Microsoft Windows Administration Guide for more information. 26 Entrust IdentityGuard 8.1 Deployment Guide Document issue: 2.0 27 Chapter 2 Authentication choices Entrust IdentityGuard provides several authentication choices for your organization to authenticate your users, perform mutual authentication, and register computers. This chapter provides information that describes the implementation considerations for each method. Note: While reading this chapter, consider the frequency of authentication events to which you want to add multifactor authentication. Ensure you gather statistics from your authentication applications and resources, and develop a usage profile for each of the transactions. You can then find an appropriate balance between user convenience, resistance to attack, and the administrative overhead for managing multifactor authentication. Topics in this chapter: Overview of available authentication methods on page 28 Authentication choices for users on page 31 Authentication choices for deploying organizations on page 51 Temporary PIN authentication on page 55 External authentication on page 56 27 28 Overview of available authentication methods This section describes and compares the authentication methods available through Entrust IdentityGuard, and the advantages and considerations of each. Entrust IdentityGuard divides the authentication methods into two categories: User authentication means the user verifies their authenticity to your organization. Examples of user authentication are: token authentication grid authentication passcode list authentication knowledge-based authentication out-of-band authentication machine authentication 28 Entrust IdentityGuard 8.1 Deployment Guide Document issue: 2.0 29 Organization authentication means your organization proves itself as authentic. Examples of organization authentication involve different types of replay authentication. Serial replay authentication (grid card serial number) Image replay authentication (user selected image) Grid location replay authentication (grid locations shown specific to user) Message replay authentication (user entered message) Combining user and organization authentication methods allows you to set up mutual authentication. Mutual authentication means both the user and your organization verify themselves as legitimate. Mutual authentication works as follows: The user completes first-factor authentication successfully. Entrust IdentityGuard presents the user with a challenge based on the authentication method. The user enters the requested values. Entrust IdentityGuard validates the entered values and authenticates the user. The Entrust IdentityGuard Server installs with a sample Web application that demonstrates how the various authentication methods work, and how you can set up your own applications to integrate with the Entrust IdentityGuard system. The Authentication choices 29 30 Entrust IdentityGuard Installation Guide includes a tutorial that describes what the sample Web application does. To deploy the authentication methods, Entrust IdentityGuard includes policy attributes that allow you to determine the characteristics of the authentication method for groups of users. For more information, see Entrust IdentityGuard policies on page 59 and the Entrust IdentityGuard Administration Guide. The following table provides a brief comparison of the Entrust IdentityGuard authentication methods. Table 3: Comparison of available authentication methods to each other Authentication method Physical requirements for end users Renewal options 1 Token Token hardware when battery dies (expected 6 to 8 years) Sample use Requiring strong second-factor authentication Grid Card Based on use or time Requiring strong second-factor authentication Passcode list Printed List Based on use or time Requiring infrequent one-time authentication Temporary PIN None Based on use or time Card, passcode list, or token is unavailable Knowledge-based None N/A Registering users and/or machines Out-of-band None 2 One-time use only Machine N/A Based on each login, time, or when users change computers Replay (mutual) Card, if using grid N/A location or serial number replay One-time highly sensitive operation Users access organization from personally-owned computers Verification of organization 1. An administrator or application can force a renewal at any time. 2. Users need a telephone number, SMS information, or account in order to receive the one-time password. 30 Entrust IdentityGuard 8.1 Deployment Guide Document issue: 2.0 31 Authentication choices for users From a single deployed solution, your organization can choose one or more second-factor methods of authenticating users. The choice depends on the risk of a given transaction or the sensitivity of your resources. The greater the risk of misrepresentation and fraud, the greater the need for additional authentication. The following user authentication methods are available: Token authentication on page 31 Grid authentication on page 32 Passcode lists on page 37 Knowledge-based authentication on page 38 Out-of-band authentication on page 43 Machine authentication on page 44 Considerations for each are described in the following sections. Token authentication Entrust IdentityGuard supports Entrust tokens and some third-party tokens. With tokens, your end users can authenticate themselves using a token dynamic password after completing first-factor authentication. Tokens represent a stronger method of user authentication than knowledge factors alone because they combine possession (the token) and knowledge (the dynamic password). Because the password changes frequently, it is impossible for a hacker to record it and use it later to log in to the system. Entrust IdentityGuard supports tokens that use response-only mode: a single call validates the user-entered password. It does not support challenge/response mode. Entrust tokens Entrust offers robust, competitively priced token devices (and the accompanying token data file) designed to easily integrate with Entrust IdentityGuard applications. Entrust tokens do not require a token PIN (also known as a static PIN). Order Entrust tokens directly from Entrust. (For more information, see Using tokens for authentication on page 110.) Other tokens Entrust IdentityGuard supports tokens from some third-party vendors. For details, refer to the Entrust TrustedCare Online Web site. Authentication choices 31 32 Table 4: Token authentication advantages and considerations Advantages It is easy for end users to use. It is impossible for a hacker to re-use password, making it a very secure second-factor authentication method. Considerations You need to determine whether to use static token PINs, if available. You need to determine how to roll out tokens and train users. Tokens are time synchronous, and therefore the Entrust IdentityGuard Server clock must be accurate to UTC within a 30-second range. Deployment types Web access Microsoft Windows remote access VPN remote access Grid authentication With grid authentication, you provide each user with a printed Entrust IdentityGuard card that contains an assortment of characters in a row and column format. Authentication works as follows: The user completes first-factor authentication successfully. Entrust IdentityGuard presents the user with a challenge based on the grid on their card, as illustrated in Figure 1. The user enters the values from their card corresponding to the requested cell locations in the challenge. In Figure 1, the challenge asks the user to enter the numbers in grid coordinates B1, E4, and G5, which are Entrust IdentityGuard validates the entered values and authenticates the user. By entering the correct response, users demonstrate that they possess the card, thus providing a second factor of authentication. 32 Entrust IdentityGuard 8.1 Deployment Guide Document issue: 2.0 33 Figure 1: Entrust IdentityGuard challenge sample John Smith ****** You can set up grid challenges in one of the following ways: One-step authentication In one-step authentication, you combine first and second-factor authentication on a single page. For example, you include the prompt for a user name, a password and a grid challenge on one page. In this approach, the application does not know the identity of the user until after login and authentication; that is, the user is anonymous until both first and second-factor authentication are complete. For an example, see Figure 2 on page 34. Authentication choices 33 34 Figure 2: One-step authentication example Two-step authentication In two-step authentication, the user logs in as usual and is then shown a second dialog containing the Entrust IdentityGuard grid challenge. Because the user has already passed first-factor authentication, the user s identity is known. This lets you add other Entrust IdentityGuard features, such as serial number replay or grid location replay (see Authentication choices for deploying organizations on page 51). For an example, see Figure 3 on page Entrust IdentityGuard 8.1 Deployment Guide Document issue: 2.0 35 Figure 3: Two-step authentication example Authentication choices 35 36 The following table lists some of the advantages and considerations of grid authentication. Table 5: Grid authentication advantages and considerations Advantages It is easy for end users to use (see Entrust IdentityGuard card usability study on page 146). It has a low cost to set up and maintain. If an attacker manages to observe several completed logins including the grid authentication challenge and response, they gain only a fraction of the total grid data. Considerations Consider grid size. For example, a 5 x 10 grid contains 16,000 three-cell challenge sets. Since Entrust IdentityGuard selects the challenge sets randomly or on a least used basis, knowing a few possible challenge-and-response combinations is useless to an attacker because the next challenge is certain to request different cells. Consider grid lifetime. Given that it is unlikely that the attacker would receive the same challenge set captured from an earlier attack, the attacker would be forced to guess at the coordinates. As the attacker obtains more and more of a user s grid contents, less guessing is required. Regular replacement of cards with newly generated grids can help mitigate this risk. Determine whether you need one-step or two-step authentication options (two-step is recommended). Deployment types Web access Microsoft Windows remote access VPN remote access Microsoft Windows desktop Deployment risks and mitigation The most likely form of attack is verifier impersonation or man-in-the middle combined with online guessing. Through mechanisms such as phishing or pharming, an attacker can capture one or more grid authentications made by the user and thus capture some information on their card. Subsequently, an attacker could use this information to attempt to authenticate to the legitimate application. A very important aspect of these attacks is that they are generally short lived. Typical phishing and pharming incidents last only a few days. According to the Anti-Phishing Working Group (APWG) as of March 2005 the average life of a phishing site is 5.8 days. 36 Entrust IdentityGuard 8.1 Deployment Guide Document issue: 2.0 37 Passcode lists Passcode list authentication is a type of grid authentication that uses a list of passcodes or transaction numbers (TANs) rather than a card. Each number can be used just once. With this approach, you provide users with a list of randomly generated passcodes for second-factor authentication. Some organizations view passcode lists as easier for their users to use than cards, though our usability study proved card use is quick to learn. (See Card usability study on page 145.) Typically, you distribute these to users on a printed sheet of paper similar to Figure 4. Figure 4: Sample passcode list Then, when a passcode is required, you prompt for the passcode next to a number in the list as in Figure 5. Figure 5: Sample passcode prompt Authentication choices 37 38 The user types the passcode printed on the paper next to the requested number. To reduce susceptibility to phishing or malware attacks, each passcode is used just once. This renders the entered passcode useless should it be captured by an attacker. To help end users remember the one-time use restriction, recommend that they strike used passcodes from the list. Alternatively, create your passcode list as a scratch card, which only reveals the passcode once a covering is scratched off. Table 6: Passcode list authentication advantages and considerations Advantages One-time use of a password makes it impossible for attackers to reuse authentication data. You can create multiple one-time passwords at once, lowering overhead. Considerations Much like the production of a grid, you need to produce and distribute the passcode lists to your users. Unlike grids, however, you will typically wish to send users more than one list at a time. Research your past authentication histories to determine how fast the average user will exhaust a list and send an appropriate number of lists to ensure that users can always authenticate. Additional consideration should be given to the way a passcode list is produced, such as whether it will be a simple list of uncovered passcodes or a covered list much like a lottery scratch card. Cost will be the primary difference between these two options. The number of characters in each passcode should be between five and nine to ensure security and to maintain usability. Choose between numeric or alphanumeric passcodes. Deployment type Web access Deployment risks and mitigation Some phishing attacks target this form of authentication. There are simple ways to increase the security of a passcode list. For example, prompt for passcodes in a random order instead of from first to last. Consider adding another form of authentication, such as machine authentication in conjunction with a passcode list. Alternatively, consider deploying grid authentication instead of a passcode list. Knowledge-based authentication One of the simplest mechanisms for gaining additional confidence in the identity of users is to challenge them to provide information that an attacker likely cannot 38 Entrust IdentityGuard 8.1 Deployment Guide Document issue: 2.0

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