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Need-to-Use: Access only to information resources needed to perform assigned tasks Access levels and privileges by role Periodic review and removal of access levels and privileges Segregation of duties for requesting, authorizing, and reviewing access levels and privileges What is required to identify users? See 7 Things You Should Know About Federated Identity to learn about the significance of federated identity in higher education. Upon logging in, the user attempts to Edit a resource (e.g., this guide section) and the user is denied since that user does not have the access to edit an EDUCAUSE resource. (e.g., EDUCAUSE Identity and Access Management (IAM) Tools and Effective Practices, NMI-EDIT Enterprise Directory Implementation Roadmap, or NMI-EDIT Enterprise Authentication Implementation Roadmap) Determine the gaps between the Institutions current IAM posture and the desired state, target services, and target users. Domains are defined based on risk and the specific security requirements of the domain. Users in this group include staff members, employee, faculty, researchers, and students. Develop the policy framework. See CommIT: Simplifying Admissions Identity Management for Georgetown University's way to leverage federated single sign-on to match electronic records for college applicants and institutions using a single set of user credentials that can be used across various services. How to reduce the number of credentials An Alternative Solution Focus on four activities: Develop an institutional Identity Management System Create a standard set of attributes for each person (eduPerson) Use a federation to enable external access Require institutional developers and in RFPs that service providers support SAML and InCommon InCommon provides an easy to use framework for customers and service providers that will work across higher education. In 2017, NIST published a significant number of revisions to their Guidance on Management of Digital Identities series (NIST 800-63-3). This is helpful in that, if a username and password are compromised, it requires an additional authentication factor before full authentication will occur. Top of page User Access Management Objective: To cover of the stages of user access life-cycle - from determining the types and affiliation of institutional users and their corresponding privileges to procedures to revoke and disable their access. Develop the required business processes. What steps are required to: Identify and register a user? To provision and de-provision credentials? While a usual password is 8 to 10 characters long, a passphrase can be twice as long. 4. Access Control Policy Access control policies should clearly communicate the institution's business requirements regarding identification of users, access to institutional information, user access rights, and special access privileges and restrictions. These changes have been brought forth by research on how users actually use highly predictable strategies to achieve mixed-character set passwords and unique passwords. Both problems are addressed by periodic review of user access rights. Effective Deployment of Multi-Factor Authentication Solutions The important take away here is that determining effective password strength requirements must also take into consideration the context of the security risks you are trying to manage, the inevitable predictable workarounds your users will employ, and the overall effectiveness and cost of associated password management activities. Sensitive System Isolation Information resources that are critical to the institution’s mission performance, resources that contain confidential information, or information that is otherwise considered sensitive should be segregated into its own environment based on sensitivity and risk. The periodic review of user accounts and corresponding access rights with system owners, disabling user accounts after a preset period of inactivity, purging them after a longer period of inactivity are all good practices to ensure that a system does not contain old, unused user accounts and to mitigate risk. It touches on the business reasons for using an additional factor, technology available, and a discussion of biometrics. Increase security (fewer usernames and passwords to manage) Lower support costs (no application-based identity management) Improved user experience (fewer usernames and passwords to remember) Challenges of Federation Deploying new infrastructure is hard. 5. When the reasons for access are no longer valid, access to the data is (or should be) revoked. An authorization process then determines which systems an authenticated user is permitted to access. Who audits identity providers' practices and what standards are used? Software as a Service (SaaS) is the capability provided to a user by a third party, to use a provider's applications running on a cloud infrastructure, which is accessible from client devices through a web browser or other means of remote connection such as a thin client. The office contacts the corresponding agencies and verifies the information provided with their records, and, if everything checks, records the sources of proof and approves the issue of a credential. Most Institutions who are pursuing InCommon Silver are using the the University of Wisconsin calculator. Define the business and regulatory drivers and their importance to the institution's missions. Map a matrix of the target users and target services and determine the required policies, processes, and technology considering the risk and the business and regulatory requirements. What criteria is used to determine the types of credentials used? Management of Administrative privileges is important since common cyberattack techniques take advantage of unmanaged administrative privileges. Some significant elements of this guidance include: Emphasis On Password Length vs Mixed-Case or Varied Character Set Constructions Passwords That Are Least 8 Characters No Need For Periodic Password Resets Users regularly defeat this control by using predictable passwords Disallowing Dictionary Terms Ensuring inclusion of Dictionary Checks For Password Creation Don’t use Password Hints or Knowledge Based These measures are often easy to defeat with poor hint selection or use of information that can be found. Improve information security, confidentiality, and user privacy by minimizing the collection, maintenance, and use of identity information. Cloud Computing and Software as a Service (SaaS) Cloud Computing is the use of a network of remote servers hosted on the Internet to store, manage, and process data, rather than a local server or local computer. Identify project stakeholders and determine who should be involved and the level and timing of their involvement. Training and communication early and often are critical. How are users affiliated to the institution? Can they have multiple types of affiliations? How to manage access? This approach not only enables institutions to attribute network activities to individual accounts, it also gives institutions the opportunity to scan systems for vulnerabilities before they connect to the network. What is required to identify users? This publication certainly warrants consideration and review as you review or revisit password requirements for your institution. Password sharing policies should be put in place along with solutions that provide needed functionality with accountability for the shared resource. See how the Indiana University is using passphrases to enhance information security. Dormant user accounts - active user accounts which show no activity for very long periods of time - poses an unnecessary risk for unauthorized access to confidential data. Examples include: Students Learning resources such as course management systems or online access to the library Online student systems such as class schedules and bill payment Staff Employee directory, webmail Online human resources systems such as timesheets, payroll, and benefits Faculty and Researchers Online course materials and library resources Federal research agencies, funding, and data resources Alumni and Donors Email for life Alumni directories and services Parents All Student/Employee directory Emergency notification systems University data governance policies and standards should define roles that can evaluate, approve and assign the level of access to systems and data based on the responsibilities, job functions, reporting or outreach requirements of users. Vendor wants to offer a service to institutions but doesn't want the burden of managing user credentials and authentication. See CommIT: Simplifying Admissions Identity Management for Georgetown University's way to leverage federated identity management to match electronic records for college applicants and institutions using a single set of user credentials that can be used across various services. Decentralized access control implementations do have benefits. By using a password manager, the user will only need to remember one strong password or passphrase. Not share their computer/network username, password, personal identification number (PIN), digital certificate, security token (i.e. Smartcard), or any other device used for identification and authorization purposes. 2e. Although having a central authentication system makes account management easier, the exposure of one stolen account is greater when it gives the attacker access to multiple systems on the network. As applied to passwords, guessing entropy is the estimate of the average amount of work needed to guess a password. Password Management Problems Need (and failure) to remember multiple passwords Need (and failure) to remember strong passwords Frequency of password change Coming up with easy to remember but difficult to hack passwords multiple times per year Need to replicate password change to multiple devices or applications Sophistication of social engineering and "phishing" attacks See Passwords, a presentation by Joe St Sauver PhD, Security Programs Manager - Internet2 for a broad discussion on Passwords and related trend, problems, alternatives, and available technologies. Ideally, individuals would each like a single digital credential that can be securely used to authenticate his or her identity anytime authentication of identity is required to secure any transaction. Source of Authority systems. Furthermore, a considerable number of Users have multiple affiliations depending on the number of "hats" an individual wears while affiliated to an institution. User Registration Identification is the process of ensuring that a user, program, or device is the entity it claims to be. Managing security and privacy is an ongoing challenge, compounded by the expanding interest in software as a service (SaaS) and cloud computing. How do application owners determine required Level of Assurance (LOA) for their applications? Top of page Resources Top of page Standards ISO NIST COBIT PCI DSS 2014 Cybersecurity Framework HIPAA Security 27002:2013 Information Security Management Chapter 9: Access Control ISO/IEC 9798-1:2010 800-100: Information Security Handbook: A Guide for Managers 800-53: Recommended Security Controls for Federal Information Systems and Organizations 800-12: An Introduction to Computer Security - The NIST Handbook 800-14: Generally Accepted Principles and Practices for Securing Information Technology Systems As stated above, many times these can be multi-dimensional and cyclical. Policy development can take considerable time. The more secure or sensitive the information resource, the more frequently passwords should be changed. As depicted below, the business requirements that drive access control needs, practices, and scope are often diverse. See this guide's Two-Factor Authentication page for an overview and technology available. The segregation of information resources can be accomplished by: Creating network domains – a collection of devices and subjects that share a common security policy. An important characteristic of need-to-know access is that access is granted for a limited period of time. Challenges The decision to procure cloud computing services or SaaS may be driven mostly by individual departments instead of institutional IT strategy. Learn more about Password Manager Tools, including the benefits and risks to consider. Define and document the Institution's current IAM posture. Who supports the end users and applications? Benefits of Federation Sharing of Resources between institutions Collaboration between institutions and users. See other Internet2 middleware initiatives in higher education, including OpenSAML Higher-education and increasing vendor acceptance Provides extended privacy functionality Open ID: a user-centric distributed web-SSO technology perceived as being lighter-weight and less focused on communities of trust than SAML OAuth: an open standard for access delegation, provides to clients a “secure delegated access” to server resources on behalf of a resource owner commonly used as a way for Internet users to grant websites or applications access to their information on other websites but without giving them the passwords. 2. Institutions should ensure that their policies comply with any applicable regulatory requirements such as those currently affecting access to student financial aid information and Controlled Unclassified Information (CUI). One thing in common among all members of an institution's constituency is that all require access to some type of institutional information for a determined amount of time - they all become users. Casual Affiliation: These are users whose affiliation to the institution is transitory, periodic, mostly informational and not established by a contract or enrollment. In recent years, there has been a significant shift in perspective and guidance on effective password composition requirements. Table of Contents Getting Started Inter-institutional collaboration, cloud computing, online/distance education, teleworking and portable computing, federation, access from anywhere at anytime, and many other business needs are challenging institutions of higher education to adapt or rebuild their Identity and Access Management (IAM) infrastructures to enable new and secure ways to further their missions as well as meet requirements from Federal and State government, industry standards, and an increasing number of business associates and partners. 1b. The credentials are compared to the identifying information previously stored on the entity and if the credentials match the stored information, the entity is authenticated. Decentralized Access Control It is not uncommon to find institutions opting for decentralized or distributed user account databases where the verification of authorization is performed by various entities located throughout the campus. However, because Windows systems work best in a Windows domain, even institutions that use Kerberos generally maintain a Windows domain controller that is synchronized with the accounts in their Kerberos domain. This information may include full name as it appears in identity documents, date of birth, current address, existing relationship with institution (e.g, hired employee, enrolled student, etc.) Identity Proofing – aligning collected data and matching an actual person to it. Institutional staff, faculty, students, retirees, alumni, prospective students, student’s parents, and members of the community access and utilize different types of information stored on and accessible via institutional systems. This information must be administered and protected in accordance to its value, and in conformance with government, and institutional rules and regulations. Common disadvantages of decentralized access control are that they can be duplicative, require coordinated work of several teams, and administrative overhead is high since changes may need to be implemented by numerous locations. The level of access will be based on the confidentiality of the data and the restrictions imposed by government and institutional rules and regulations. User Types and Affiliations Institutions of higher education have a broad user base with varying degrees of affiliation. Also, when people go on vacation, they may need to give someone temporary access to data on their computers, in e-mail, and on other systems. Users shall Access data and comply with the duties of their role or job duties on a need to know basis. Staff and skill sets. Password-protect and lock their desktops/laptops when left unattended Top of page Operating System and Applications Access Controls Objective: To cover the mechanisms that an institution can use to ensure that only authorized users have access to institutional computing devices. To be properly authenticated, the entity is required to provide credentials - a unique identifier such as a username and a password, passphrase or token. If the individual is unable to fulfill the proofing requirements in-person (e.g., staff in a small satellite campus, researcher in the field in a different country/continent), they can utilize approved University secure file exchange services to send electronic imprints of identity materials along with supporting documentation. Next, the Access Control mechanism controls what operations the entity may or may not make by comparing the credentials provided to an access control list. Access is the flow of information between an entity requesting access to a resource or data and the resource. See Privilege Management Recipe for best practices and processes for establishing a privilege management system. Top of page User Responsibilities Objective: To underscore the importance of the active participation of users in safeguarding the access privileges, credentials, privileges provided to them and practices needed to prevent the unauthorized user access and disclosure of privileged information. User wants seamless access to services. Access Control Decisions Institutions of higher education create, collect, and makes available information in support of their educational, healthcare, and research missions. Controlling network data flows using network routing and switching capabilities – e.g., access control lists (ACLs) 2c. What is the institution's IAM and policy governance approach? Identity and access management refers to the policies, processes, and technologies that establish user identities and enforce rules about access to digital resources. The latter happens when a user account accumulates privileges over time as roles and assigned work tasks change. Single Sign-On Single Sign-On, also known as SSO, is an authentication process that allows a user to access multiple applications with one set of login credentials. Clearly understand and articulate the institution's IAM desired state, target services, target users, and impacted functions (e.g. single-sign on, two-factor, federation, automation of IAM processes, etc.). To provide support and training? Good security and identity practices help ensure that an individual using an electronic credential is the person you think it is. What is the role of Information Security Governance? The reason for changing passwords regularly is that the longer a password remains the same and the more often the same password is used, then it is more likely that the password will be discovered or compromised. Examples include: Federal and State regulations. Drivers Increasingly, people must easily and securely exchange information across the internet, among known individuals and be trusted to access restricted resources, without having to struggle with numerous and onerous security processes. Password entropy is expressed in bits. Since the user was denied access, the user requests to be given rights to edit the resource. Related links and additional information: 1a. The former happens when a user has more access or permissions than the assigned work tasks and/or role requires. See Provisioning Remote Users for a discussion of the general challenges of provisioning remote users and the specific impact of HEOA regulatory requirements that ask accrediting organizations to evaluate college identity procedures for distance education students. Roles and responsibilities. Security officer wants to protect University assets, user identity information, and passwords. Most institutions of higher education require all members of their communities to have their own unique username and password to access certain resources. To prevent reuse of passwords and assist users with remembering multiple passwords, a password manager can be used. The entity can be a device, process, or a user. Two-factor adds an extra layer of security by not only requiring “something you know”, such as a password, but also an added factor which could be “something you have” such as a smartcard or your smartphone, “something you are” such as a fingerprint or a retinal scan, or even “someplace you are” such as only being able to sign-in from a specific location. Examples: Student → Student/Worker → Employee/Staff/Faculty → Retiree Student → Alumni/Donor Applicant → Employee/Staff/Faculty → Former employee Prospective/Expected User → Active User → Deactivated User → Deleted User The examples above are one-dimensional and serial. The User registration process generally has four steps: Identity Vetting: the collection and validation of identity information. 3. Approaches and products. Password entropy is a mathematical way to measure the difficulty of guessing or determining a password. Institutions can also review best practices shared by information security professionals who have implemented 2FA to increase security on their campuses in our Two-Factor Authentication: Lessons Learned paper. The strength of a password is determined by several factors such as password length, password age, case usage, numeral usage, use of special characters, and reuse restrictions. Access control is any mechanism by which a system grants or revokes the right to access some data, or perform an action. VPNs can be established between remote users and a network or between two or more networks thus using the Internet as the medium for transmitting information securely over and between networks via a process called tunneling. Federation Technology Standards Security Assertion Markup Language (SAML): Standard developed and ratified by OASIS, an international non-profit standards organization, and managed by the OASIS Security Services Technical Committee Has broad vendor and industry acceptance Shibboleth: Open source software package for web single sign-on across or within organizational boundaries SAML-based software managed by Internet2. Remotely. See CommIT: Simplifying Admissions Identity Management for Georgetown University's way to leverage federated single sign-on to match electronic records for college applicants and institutions using a single set of user credentials that can be used across various services. Mobile Computing and Teleworking Teleworking (i.e., telecommuting), e-commerce, online education, and the increased use of portable computing devices such as laptops, tablets, and smartphones are driving the need for access to information resources from any place at any time. Two-Factor Authentication: Is a Username and Password Enough? In cases where users have administrative rights to their devices, the attacker can take over the device and install keystroke loggers, sniffers, etc. Many stakeholders, technology areas, policies and processes must work together for a scalable and robust IAM Program. If one access control point fails, others can balance the load until the problem is resolved. To get started with IAM projects, big or small: Define the challenge and the approach to meet it. Single Sign-on makes signing in to multiple services easier for the end user since they are not required to remember multiple passwords for use with institution resources. Also, it may not be as easy to come up with easy to remember strong password very 30 or 60 days. Roles and responsibilities Need-to-Know: Access only to information needed to perform assigned tasks. The infrastructure must be there before gains can be realized, which makes justification a challenge. IAM systems in the future will need to transition to entity relationship management that includes users (people), devices, and services. Requirement for vetting users in person Requirement to archive records concerning user identification and credentialing What criteria is used to determine the types of credentials used? Another common attack involves domain admin privileges in Windows environments potentially giving an attacker significant control over numerous devices and access to the data they contain. The following can be included in the institution's Acceptable Use or Information Security Policy. For instance, individuals in upper management often ask an administrative assistant to check their e-mail. Identification of roles with privileged access Contractual obligations for limiting access granted to vendors and partners What is required from identity providers and from service providers? (William Weems, Ph.D. UT Health Science Center at Houston: Sharing Restricted Resources Across Organizational Boundaries) Traditional forms of authentication and authorization are no longer sufficient or the level of assurance needed by modern internet-based applications Increase security Compliance with federal and state rules Application security is becoming increasingly onerous (multiple applications, multiple enterprises, and multiple user roles in multiple contexts) Inter-institutional collaboration Operational efficiencies and cost control Examples: Institution wants to offer services to their constituents but doesn't want to host them. At a high level, institutions can divide Users into two groups based on their type of affiliation to the institution: Formal Affiliation: These are users whose affiliation to the institution is established by formal contract, employment, or enrollment. Credentials are usually issued as an UserId / Password pair but they can also be embedded in other devices such as Id Cards, second factor tokens (See Two-Factor Authentication topic below) Related links and additional information: See UM Community System: Expanding Identity Boundaries for the University of Maryland's approach to establishing UM identities to users outside the traditional campus user base such as volunteers, visiting students, or contractors. To Change or Not to Change? Privilege Management Privilege management is the set of processes for managing user attributes and policies that determine a user's access rights to an information resource. See the following InCommon Assurance link for helpful Password Entropy Calculators. How to integrate these applications into institutional web services? Not attempt to access data or programs contained on systems for which they do not have authorization. What is required from identity providers and from service providers? Develop the technology framework. Centralization of distributed services including authentication. Review of Access Rights Least privilege and need-to-know access underscore the importance of the periodic review of user accounts and their corresponding access rights. Many in the higher education community demonstrate compliance by applying the access control requirements in NIST 800-171. For a comprehensive discussion of major identity and access management functions in the cloud, see: Identity and the Cloud - Preparing Your Campus. Upon verification of membership in an EDUCAUSE Working Group and establishing the business need, the user is added to the list of users that have the right to edit the resource. Conversely, the argument against changing passwords regularly is that strong passwords are reasonably secure and they take longer time and more effort to guess thus making them less likely to be discovered or compromised. Requirement to identify the security requirements of applications - both, purchased and developed internally Requirement to determine the Level of Authentication (LOA) required to access a service based on risk The EDUCAUSE Access Control page contains publications, presentations, policies, podcasts, and blogs regarding mechanisms by which a system grants or revokes the right to access some data, or perform some action. Effectively managing this access requires clear methods for documenting who has access to systems at any given time and mechanisms for periodic audit reviews of the users to ensure that access is given only to appropriate individuals. One drawback is that each location may be maintained by local administrators without the input / coordination of the other teams. The main difference is that a passphrase is longer. With an enterprise identity management system, rather than having separate credentials for each system, a user can employ a single digital identity to access all resources to which the user is entitled. 2b. Information security controls specifically targeting mobile computing and remote access to information resources are becoming an increasingly critical component of any institution information security program ensuring the protection of the integrity of the institutional networks while allowing remote access to it. Federation A federation is an association of organizations that come together to exchange information, as appropriate, about their users and resources in order to enable collaborations and transactions (InCommon.org). 2d. If the entity provides proper credentials, they are allowed to login. Is self-service capability available for password resets? Less sign-on is ideal - using centralized authentication for most systems but maintaining separate accounts on computer systems that contain particularly sensitive data and require added protection and overall maintenance. These factors help to reduce the average number of guesses an attacker must try to guess the password and ease with which the attacker can test the validity of the guessed password. IAM Programs Seek To Securely Manage Digital Identities Through Their LifeCycle Note: It is important to remember that the identity life-cycle applies for each type of relationship or affiliation that an individual may have with institution. The following could comprise the core of an institutional access control policy framework. Examples: Administrators with Faculty appointments Student Staff Staff or Faculty and Parent of Applicant or Student Staff and Alumni Staff and Employees who are also Students pursuing a degree Emeriti Faculty Lastly, it is important to understand the affiliation life-cycles and User transitions that should inform an institution's User Access Management process. The Enterprise Authentication Implementation Roadmap, from the NMI-EDIT consortium, is a recommended approach that can be used by institutes of higher education to build enterprise authentication services to enable appropriate interoperability with peer institutions, the Federal Government, industry, and other partners. Systems should be locked when left unattended. Other institutions use Kerberos because it supports a broader range of applications and operating systems. Normally, an entity must first login to the resource using some authentication system. There are several free and enterprise level products available for use. The office compares the picture to the person, verifies the information with its records and, if everything checks, records the sources of proof and approves the issue of a credential. 1. Specifically, usernames and passwords are no longer sufficient or completely secure to authenticate to information resources containing confidential information. Operating System Access Control 1a. Good policy and governance helps ("trust but verify") Making it ubiquitous across entities of varying size is a challenge. This document describes the use of a second factor in addition to the traditional User ID/password pair to minimize the probability of fraudulent authentication. Password Management Good Password Practices Use strong passwords or long passphrases Do NOT write passwords down Do NOT share passwords Use different passwords for different applications (e.g., work vs personal; shopping, and banking vs casual email and Facebook; applications that contain confidential information vs those that do not, etc.) What is a Strong Password? The individual is required to go to the institutional office charged with User registration and produce a valid current government photo ID that contains the individual's picture (e.g., driver's license or passport) and an address. Users should be granted access based on least privilege - the most restrictive set of permissions or access rights - needed to perform assigned work tasks. How is vetting / credentialing performed? Min-entropy is the measure of difficulty of guessing the easiest single password to guess in the population. Improved user experience (e.g., reduced sign-on, self-services, remote access and telecommuting, etc.). Two-Factor Authentication is the use of an additional factor to minimize the probability of fraudulent authentication. How often should passwords be updated? In addition, governance plays a key role in the success of any IAM Program and implementation. In other words, a user’s username and password associated with the institution, would allow access to many or all institution systems that the user is authorized to access. Top of page Overview Access control is the use of administrative, physical, or technical security features to manage how users and systems communicate and interact with other information resources. The optimum solution for this function may be a well-planned and institution-wide Identity and Access Management (IAM) program. For Service Providers in an identity federation, having Identity Provider Operators support a standard practice set (or profile) can mitigate the risk of service compromise. Are authentication requirements for applications and services risk-based? The EDUCAUSE Mobile Internet Device Security Guidelines page contains helpful advice to develop mobile Internet device security policy, standards, guidelines and procedures. Today's mobile work force and mobile users are no longer just staff, faculty, and students trying to check e-mail from home, they are telecommuters, business partners, students. Implementing virtual local area networks (VLAN) and/or virtual private networks (VPN) for specific user / application groups. See Identity Verification for the University of Indiana's approach to verify the identity of affiliated individuals including alternatives for verifying an identity when in-person vetting is not an option. Information Access Restriction The EDUCAUSE Access Control page contains presentations, policies, and articles regarding mechanisms by which a system grants or revokes the right to access some data, or perform some action. This can be done either: By leveraging a pre-existing relationship with an individual (e.g., individual was a former student or a former employee) In-person. Centralized Access Control Rather than maintaining separate accounts on each system, some institutions use a central account database that all systems can authenticate against. In addition, institutions authenticate these individuals before allowing them to connect to the campus network or Internet. Authentication Authentication is the process to confirm the identity of an entity requesting access to an information resource. Challenges of Mobile Computing User Authentication Protection of Transmitted Data Protection of the Institutional Network To enable remote access to institutional information resources, institutions of higher education are implementing Virtual Private Networks (VPN) technology to provide a secure connection to the institutional network from remote locations such hotels and airports. How do Identity providers comply with applications' LOA requirements? and patients who rely on access to institutional networks to accomplish day-to-day business, attend classes, and follow-up on medical treatments. A well implemented and coordinated distributed system does not have single point of failure. Users in this group include guests, retirees, donors, parents, library patrons, alumni, and external vendors. Users are granted access to this data on a need-to-know basis - when there are justified work-related reasons for access or the need to know. Traditional Approach Federated Approach First Steps Technically speaking, it involves: new policies new processes new trust relationships new authentication and authorization mechanisms new enterprise directories new applications and much more Participating organization must agree on: Technical specifications: data attributes to exchange, the software to interoperate with Policy specifications: privacy, establish trust and trustworthy data Must provide two sets of services: Metadata management: aggregate, distribute, and maintain members' attribute data, syntax, and semantics Trust management: federation and member operation practices and control privacy and security policies Things to Think About Policy work is very slow, but critical - start work on this early Do not underestimate the difficulty of application integration with new or legacy infrastructure Authorization can be quite a challenge (e.g., how to identify subsets of people) Consider new support models Communication and coordination are key Keeping all stakeholders motivated and involved can be a challenge Policy Issues Which services reside where? Compared to passwords, a passphrase is generally stronger because it is more memorable than passwords thus reducing the need to write them down, they make some types of brute force attacks more difficult since they are much longer than passwords, and they make phrase or dictionary attacks harder if the passphrase is well constructed. This brief may be used to explain the concept to others on campus, as well. In many environments, a Windows domain controller functions as the central authentication system. Users should be made aware of their responsibilities towards protecting their issued credentials, choosing strong passwords and keeping them confidential, as well as preventing unauthorized disclosure of sensitive information under their care. Password Sharing Policy It is important to realize that people will share or reuse their passwords on multiple accounts unless you provide them with some other method of allowing specific individuals to access information in their accounts. New constituencies (e.g., online students, student apps and parents, alumni sand retirees, contractors and service providers, patients, peers and collaborators, etc.). For Identity Providers, it is a way to provide single sign-on access to applications requiring an increased level of confidence in a credential. Many times, the smaller organizations will benefit most. What is the degree of centralization? Are authentication decisions made by system, by application, by department or centralized (e.g., LDAP)? Two common problems related to privilege management are excessive privilege and creeping privilege. Solutions to Password Management Problems Passphrases A passphrase is a different way of thinking about a "secret" or "something you know". to find administrator passwords and other confidential data. Access Control Program As data, access, and networks continue to expand, institutions have an increasing need to manage identities and access. Even though there is no "right"or "perfect" answer, the following points are worth considering: Password policy should be based on risk, vulnerabilities, and deployed safeguards The amount of time between changes should be determined by the required strength of the passwords being used Password changes makes it harder for users to use the same password for multiple services (i.e., forces password "diversity") Periodic password changes, especially when done as a routine, could limit successful phishing attempts since users would know when it is time to change passwords and when it is not. An attacker can trick a user into downloading an application from a malicious website or opening a malicious email attachment which contains executable code that installs and runs on the user's device. Define the approach needed to meet the challenge (i.e., high-level description of policies, technology, business processes that need to be addressed). "Single Sign-On". How to manage provisioning? Therefore, single sign-on is not necessarily desirable in higher education environments where password theft is a common risk. In a campus setting, many information systems–such as e-mail, learning management systems, library databases, and grid computing applications–require users to authenticate themselves (typically with a username and password). Password Managers Users may have to remember multiple passwords for different systems, especially if Single Sign-On is not in use for all institutional systems. How are identifiers and credentials issued to users? Is the provisioning process consistent throughout the institution? In-person vetting? What criteria is used to determine the level of access to applications and services? Does the institution have policies for identity and access management, information technology, and information security in place? Also, the benefit of an "expiration date" on a password is that it limits the amount of time a lost or compromised password can be used by an unauthorized party. Creation of a master identity record Issuance of credentials - each credential issued shall include a unique identifier (e.g., UserId) that distinguishes it from all other credentials issued to the individual and shall clearly associate the credential unique identifier to the individual's master identity record. Not circumvent password entry through use of auto logon, application "remember password" features, embedded scripts or hard-coded passwords in client software. VPNs send data securely through a shared network. The InCommon Assurance Program awards certifications to qualifying institutions of higher education and research organizations that support InCommon requirements for consistent management of digital credentials. It is important to keep in mind that the current model for managing identity becomes more problematic when relationship complexity is added. Specifically, the concept and benefits of participating in InCommon, campus policy requirements, preparing institution identity management infrastructure, choosing and installing the appropriate standards-based software, and collaborating with other institutions of higher education and with resource providers. Does the institution have an information technology roadmap? However, within a complex organization, establishing an IAM program is not an easy task. They may have multiple simultaneous roles (e.g., faculty & staff members, students, and full-time employee). Integrating separately developed applications into an integrated approach. Lightweight Directory Access Protocol also known as LDAP is another approach to centralized authentication and authorization that is increasingly used in higher education institutions. Authentication protocols and technologies. Application and Information Access Control 2a. Top of page Business Requirements of Identity Management and Access Control Objective: To describe what institutions must consider when establishing and documenting the rules that control access, authorization, and dissemination of information and restricting the access to institutional networks. Examples of access control: When a user is prompted to provide a username and password to be able to access EDUCAUSE resources (e.g., this guide). Also by creating domain trusts - a security bridge between network domains to enable users of one domain to access resources from another. Information security professionals are continuing to make the case that passwords and password practices are bad and getting worse. Trust can be difficult to achieve. Some data may be restricted from general access by users and may require additional levels of approval before being made available. The guide's Cloud Computing Security page contains security, privacy, identity, and other compliance implications of moving data into the cloud as well numerous higher education and industry resources on the topic. To request, grant, and modify access to applications and services? In other words, the user attributes, job functions, and organizational affiliations can serve as the basis for access authorization decisions. Not share passwords used for digital signatures. Example, students may be placed on a separate VLAN from faculty and staff. How Often? In its simplest form, IAM ensures that only the right people can access the right services at the right time.

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