2026
Edition

The Guide to Securing PowerBuilder Apps

Strengthen Security • Demonstrate Compliance • Without Rewrites

PowerBuilder

Visual Expert

Visual Guard

contact@novalys.net

Executive Summary

Context

PowerBuilder applications are at the heart of critical processes across many sectors: finance, healthcare, logistics, industry, and public sector. Some of these applications must now meet higher security and compliance requirements than when they were originally designed.

Three Key Objectives

1. Enhance security without rewriting the application, using recent versions of PowerBuilder and specialized tools.
2. Identify, prioritize and correct key risks to reduce exposure to vulnerabilities and pass audit controls.
3. Demonstrate compliance with standards (ISO 27001, NIST, PCI DSS, HIPAA, SOX, GDPR) by providing verifiable evidence.

Nine Thematic Chapters

1. Securing executables and deployed components
2. Encrypting data at rest and in transit
3. Adopting modern and secure network protocols
4. Securing exchanges with external services and APIs
5. Reducing embedded browser attack surface
6. Securing the build and deployment chain
7. Strengthening authentication and access control
8. Migrating to a modern architecture (PowerServer)
9. Achieving compliance with modern standards

Three Complementary Tools

PowerBuilder	Native security features: code signing, encryption, modern protocols (TLS 1.3, HTTP/2, OAuth 2.0, REST), token-based authentications, etc.
Visual Expert	Static code analysis (SAST) for PowerBuilder: detection of vulnerabilities, hard-coded secrets and unsecure practices.
Visual Guard	Identity and Access Management (IAM): MFA authentication, permissions, audit, reporting, Separation of Duties (SoD), compliance.

What You Will Gain

- An action plan to strengthen the security of your PowerBuilder applications
- A compliance roadmap linking technical measures to standards requirements

The 2026 guide to securing PowerBuilder applications

Tools and methods for enhancing security and complying with modern standards

Contents

1. Introduction 3
2. Securing executables and deployed components 5
3. Encrypt data at rest and in transit 7
4. Adopt modern and secure network protocols 9
5. Secure exchanges with external services and APIs 11
6. Reduce the attack surface related to the embedded browser 13
7. Secure the build and deployment chain 15
8. Strengthen authentication and access control 17
9. Optional: migrate to a modern architecture with PowerServer 19
10. Bring applications into compliance with modern standards 21
Checklists for securing a PowerBuilder application 23
FAQ 26
Bibliography – sources cited in this guide 28

1. Introduction

Who is this guide for

- **Teams in charge of PowerBuilder applications**: developers, architects, project managers, and operations managers. It explains how to strengthen application security and secure their lifecycle (dev/testing/production).

- **Security and compliance teams**: application security managers, CISOs, GRC teams, internal or external auditors. It helps assess the security level of a PowerBuilder application and prepare for an audit or compliance review.

Why read this guide

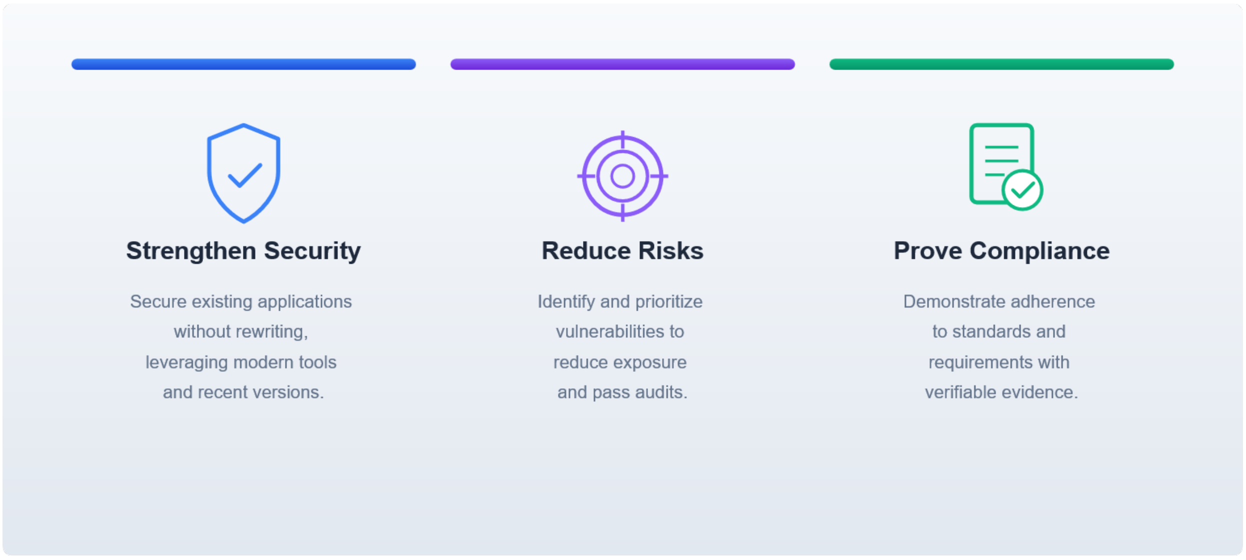
PowerBuilder applications are at the heart of critical processes (finance, healthcare, logistics, industry, public sector). They must now meet higher security and compliance requirements than when they were designed: client workstation protection, strong authentication, encryption, access control, traceability, audit reports, etc.

In this context, organizations must simultaneously meet three objectives:

1. **Enhance security without rewriting the application**, using recent versions of PowerBuilder and specialized tools.

2. **Identify, prioritize, and correct key risks** to reduce exposure to vulnerabilities and pass audits.

3. **Demonstrate compliance** with internal or external standards and requirements (ISO, NIST, PCI, HIPAA, SOX, GDPR) by providing verifiable evidence.


Strengthen Security
Secure existing applications without rewriting, leveraging modern tools and recent versions.
Reduce Risks
Identify and prioritize vulnerabilities to reduce exposure and pass audits.
Prove Compliance
Demonstrate adherence to standards and requirements with verifiable evidence.

What you will gain

By reading this guide, you will have:

- An **action plan** to strengthen the security of your PowerBuilder applications, from executable integrity to access control and auditing.
- a **compliance roadmap** linking these technical measures to the expectations of standards and regulations.

This guide is **modular** and can be read selectively.

Each chapter is independent and structured for quick reading: contexts, threats, technical objectives, features of each tool, compliance with key standards, evidence.

It can serve as a basis for a security or compliance project.

2. Securing executables and deployed components

Context and risks

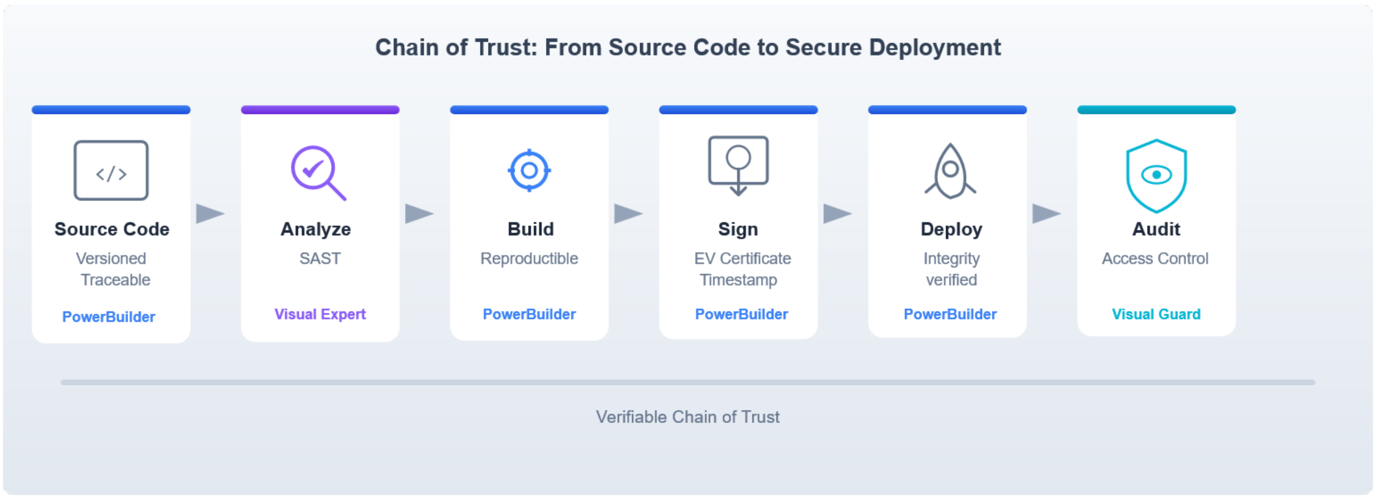
PowerBuilder applications are often deployed via internal distribution mechanisms (network shares, packages, general-purpose deployment tools) and based on implicit trust in the delivered executable.

With the hardening of workstations, an unsigned or untraceable executable is often blocked, while a compromised binary may be accepted if controls are weak.

This risk goes beyond ease of deployment: it corresponds to a scenario of compromise of the software chain, as illustrated by the 3CX incident in 2023: a legitimate application was infected and distributed on a large scale, paving the way for multiple intrusions before detection.

Furthermore, attackers seek to take advantage of the trust placed in signed elements: Sophos has documented 133 malicious Windows drivers, 100 of which were signed through the WHCP program.

The solution is to establish a verifiable chain of trust: analyze before publication, systematically sign artifacts, track deployed versions, and limit publication rights.



Objectives

- Implement a reproducible and versioned compilation process associated with a version of the application.
- Systematically sign executables, libraries, and deployment packages with a certificate approved by the organization.
- Verify the integrity of artifacts (e.g., via a hash) before distribution.
- Track deployed versions, their hashes, release dates, and responsible parties.
- Restrict and audit publication and administration rights related to deployment and security.

Features and tools

Integrate code signing into the compilation and deployment process, including for PowerServer and PowerClient projects.	PB
Use extended validation certificates (EV certificates) to sign applications, improving user confidence and compatibility with modern security policies.	PB
Secure deliveries by analyzing PowerBuilder code and detecting vulnerabilities and bad practices using security rules (SAST) dedicated to PowerBuilder.	VE
Detect hard-coded identifiers/passwords, encryption keys, and IP addresses in the code to reduce the risk of leaks through decompilation or copying of deployment scripts.	VE

Compliance

This chapter typically addresses expectations related to software integrity and release cycle control, often found in standards such as ISO 27001 and in SOX-compliant environments. (Security Standards & Compliance)

Evidence

- Signing procedure (certificate, timestamp, responsibilities) and proof of execution in the pipeline.
- Visual Expert report associated with the signed version (vulnerabilities, severity, corrections).
- Visual Guard audit history on sensitive operations (administration, changes in authorizations). (Audit Activities)

3. Encrypt data at rest and in transit

Context and risks

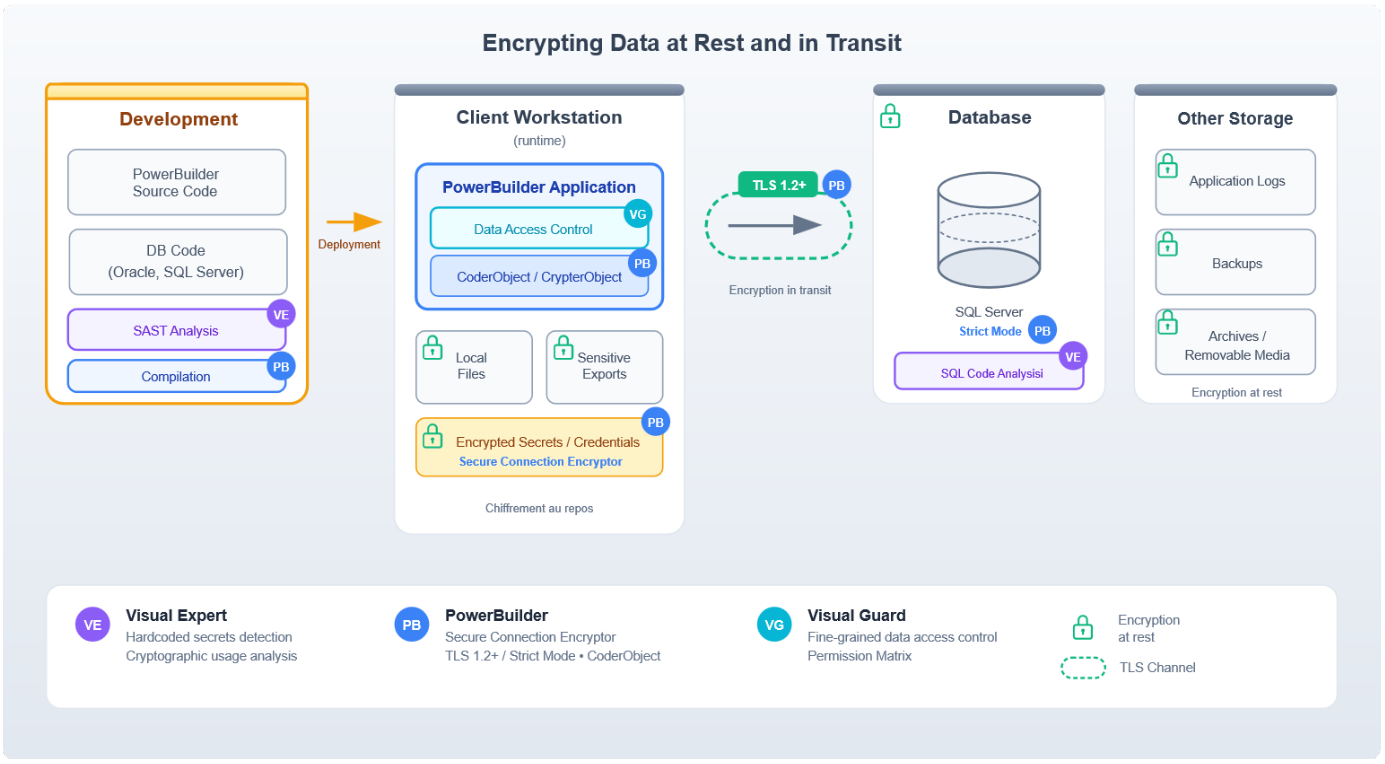
PowerBuilder applications often process sensitive data (business, personal, medical, financial, etc.). This data is transferred between the client, the database, and intermediate components. It is also found in exports, temporary files, application logs, and backups.

Loss of system and data availability is a common problem: ransomware is present in 44% of confirmed breaches (Verizon 2025 DBIR – Executive Summary).

But these attacks may be accompanied by prior exfiltration of information ("double extortion"), turning the incident into a data leak and a compliance crisis. (CISA – Ransomware Guide).

In the healthcare sector, the MD Anderson case resulted in major regulatory sanctions due to unencrypted storage (workstations, laptops, removable media).

The solution is to make data unreadable outside of its context: encryption at rest, encryption in transit, rigorous key management, and limitation of associated privileges.



Objectives

- Identify sensitive data handled by the application and its locations (database, files, exports, logs, backups).
- Encrypt secrets and sensitive parameters to prevent them from appearing in plain text in code, scripts, and configuration files.
- Encrypt communications between the client workstation, application servers, and database, applying the encryption modes recommended by the company.
- Secure local storage and sensitive exports when the client workstation may contain critical data.
- Verify that the algorithms, key sizes, and cryptographic parameters used are compliant and maintained.

Features and tools

Encrypt the connection properties of transaction objects and generate an encrypted connection string using the Secure Connection Encryptor to avoid clear-text credentials in scripts or files.	PB
Encrypt SQL Server connections by enabling TLS/'Strict' encryption in the SQL Server driver and on the database side, and validate certificates.	PB
Encode and encrypt data with the CoderObject and CrypterObject objects.	PB
Scan PowerBuilder code to detect uses of DES/3DES, obsolete hash functions (SHA-1/MD5, etc.), encryption modes, hard-coded keys or non-robust key sizes.	VE
Reduce exposure by precisely controlling access to sensitive data and functions via a permissions/roles model. (Permissions)	VG
Log access to sensitive data and critical operations. Enable detailed auditing (who did what, when, and from where). (Traceability & Audit)	VG

Compliance

This chapter contributes to the confidentiality and data protection requirements in ISO 27001, NIST SP 800-53, PCI DSS and, depending on the context, HIPAA and GDPR. (Security Standards & Compliance)

Evidence

- Connection encryption configuration (DB profiles, application settings) and secret rotation procedures.
- Visual Expert report demonstrating the absence of hard-coded secrets and the reduction of cryptography-related risks. (Detect security vulnerabilities in PowerBuilder code)
- Exports of permission matrix and Visual Guard audit histories for sensitive areas. (Permission Matrix) (Audit Activities).

4. Adopt modern and secure network protocols

Context and risks

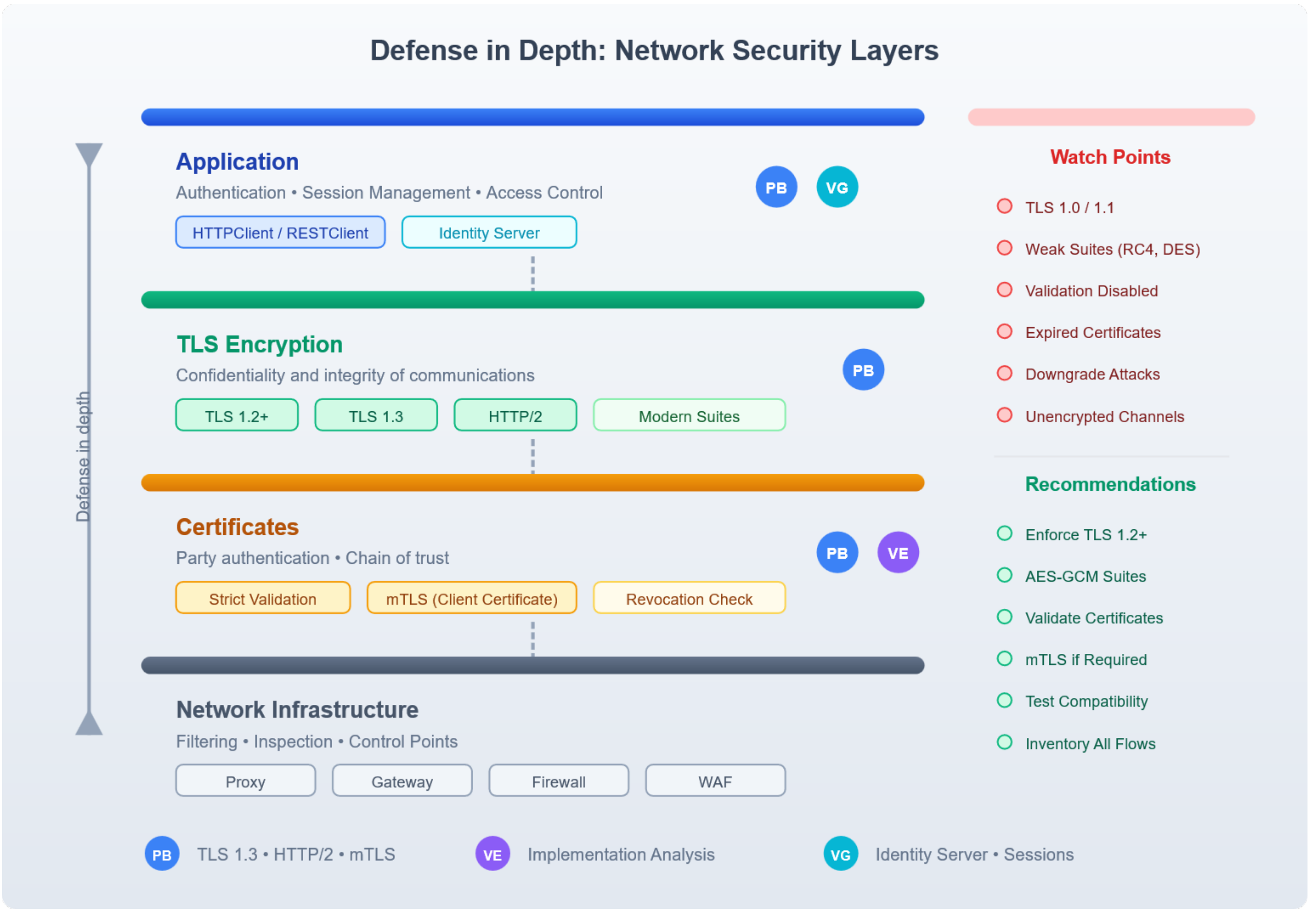
The infrastructure of PowerBuilder applications has evolved over the years (drivers, middleware, proxies, gateways).

Risks arise when using outdated protocols, weak cryptographic suites, or unencrypted channels: interception or manipulation of traffic (authentication, data, tokens), or blocking of an application if a proxy, server, or database requires TLS 1.2+ or strict mode. The security incident then becomes a production problem.

The NIST SP 800-52r2 publication therefore recommends TLS 1.2 as a minimum and sets configuration requirements to reduce downgrade attacks and encryption errors.

In terms of compliance, PCI DSS requires the use of strong cryptography to protect payment data when transmitted over open networks.

The solution is to inventory traffic flows, tighten TLS settings, and standardize network components.



Objectives

- Inventory the network flows used by the application and the protocols actually negotiated (TLS versions, cryptographic suites, certificates).
- Eliminate obsolete protocols and enforce TLS versions and configurations that are aligned with the organization's security policy.
- Implement mutual authentication (client certificate) when the environment requires it, particularly for internal APIs or partners.
- Standardize certificate validation and error handling to prevent bypasses and silent degradations.
- Test compatibility with proxies, gateways, and network protections to prevent security controls from blocking production.

Features and tools

Support TLS 1.3 and HTTP/2 with HTTPClient and RESTClient objects.	PB
Support mutual TLS authentication (client certificate), for example for internal APIs or partner services.	PB
Identify code communication points (HTTP clients, web service calls, certificate management)	VE
Detect uses that do not support modern security protocols (e.g., calls to SOAP/INET services or use of unsecured authentication APIs). Prioritize network refactoring.	VE
Use standardized web services for authentication, access control, and logging via a dedicated server to centralize controls and limit client-side security logic.	VG

Compliance

This chapter contributes to the controls related to communications security in ISO 27001 and NIST, and frequently meets audit requirements in the finance and healthcare sectors. (Security Standards & Compliance)

Evidence

- TLS settings (versions, suites, certificates, mTLS if applicable) and connectivity test results. (Supports two-way TLS authentication - What's New)
- List of application endpoints and justification of protocols used.
- Proof of integration of centralized authentication (Identity Server) for exposed flows. (How to use Identity Server API?)

5. Secure exchanges with external services and APIs

Context and risks

Following the modernization of systems, many PowerBuilder applications consume APIs, communicate with SaaS platforms, or automate exchanges via messaging or internal services.

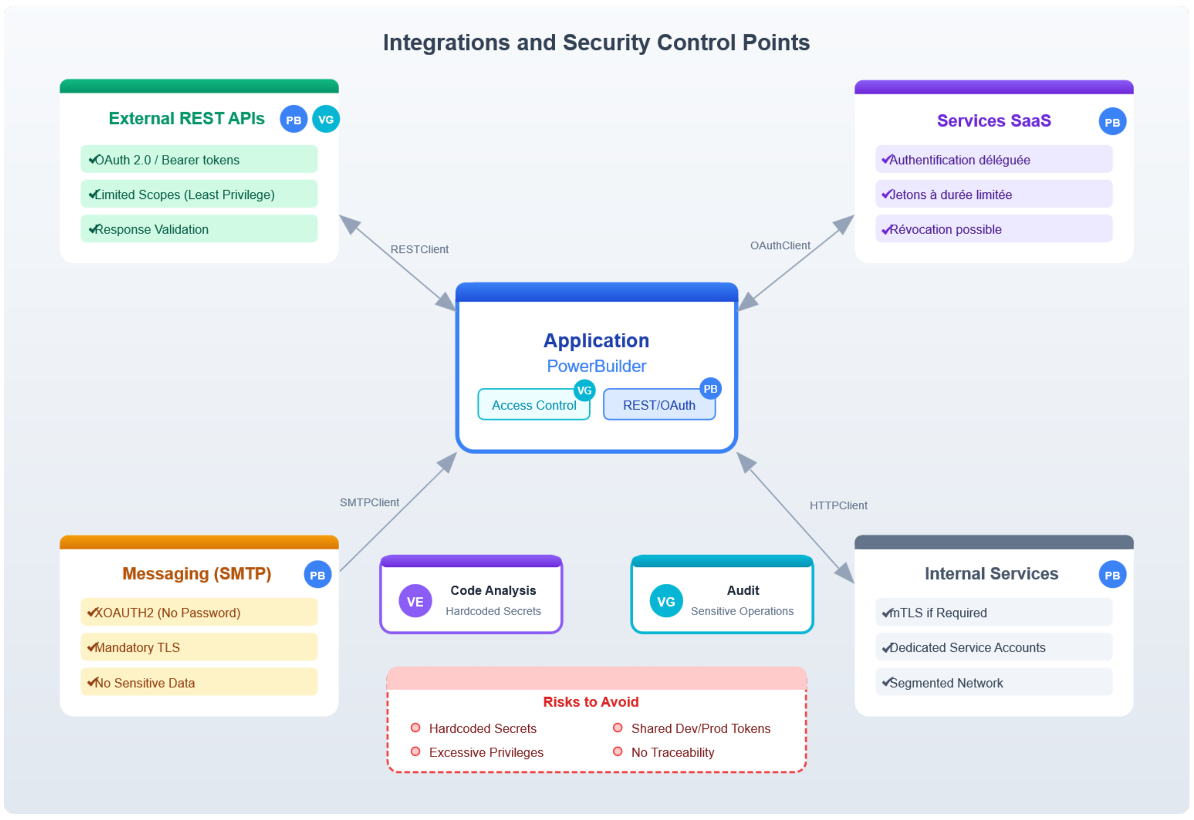
This openness speeds up projects, but it also creates entry points: incomplete access controls, overly permissive tokens, insufficient input validation, or secrets shared between environments. An application calling APIs with a token stored locally or shared between environments (dev/test/prod) can open the door to an attack in the event of a workstation compromise or configuration leak.

OWASP points out that the most critical weakness on the API side remains the lack of object-level access controls.

In terms of business processes, the FBI IC3 2024 report estimates losses related to compromised business emails at $2.77 billion (wire transfer fraud, invoice hijacking, etc.).

The Optus incident (2022), which affected approximately 10 million customers, illustrates the extent of exposure when customer data becomes accessible via the Internet.

The response is to standardize authentication, limit privileges and the exposed surface area, and control exchanges.



Objectives

- Identify integrations (APIs, internal services, SMTP) and the data exchanged.
- Implement standard authentication between systems (e.g., OAuth).
- Strictly limit privileges associated with tokens and technical accounts.
- Remove hard-coded secrets and organize their storage, rotation, and revocation.
- Avoid exposing sensitive information in messages and logs.
- Control and track high-impact operations (exports, transmissions, critical actions).
- Implement mechanisms for detecting abuse.

Features and tools

Prefer REST-based integrations using RESTClient. If SOAP is required, use HTTPClient with TLS 1.2+ with strong authentication, and avoid legacy SOAP client implementations.	PB
Use the OAuth 2.0 authorization protocol to align with common API integration practices. (Enhanced RESTClient object - What's New)	PB
Use token-based authentication (OAuth 2.0 bearer tokens) rather than transmitting usernames and passwords, and manage tokens with HTTPClient and OAuthClient. (HTTPClient and OAuthClient enhancements - What's New)	PB
Natively support SMTP and use modern authentication methods (including XOAUTH2). Reduce potentially fragile in-house implementations. (Native email support (SMTP Client) - What's New)	PB
Scan code to identify possible attacks by code injection in SQLs, OS commands or Path, hard-coded secrets, insufficient error handling, or lack of controls on exchanged data.	VE
Limit who can trigger sensitive calls (export, sending, business actions)	VG
Track these operations for audits and investigations. Monitor in real time and trigger notifications in the event of critical or unusual events.	VG

Compliance

Integrations controls contribute to the security and traceability requirements of ISO 27001, NIST, PCI DSS, and, depending on the scope, HIPAA. (Security Standards & Compliance)

Evidence

- Inventory of integrations (API, SMTP, internal services) and authentication method used (OAuth, certificates, etc.). (Enhanced RESTClient object - What's New) (Native email support (SMTP Client) - What's New)
- Visual Expert report certifying the absence of hard-coded secrets and that the main risks have been corrected. (Detect security vulnerabilities in PowerBuilder code)
- Visual Guard logs showing the execution of sensitive operations and any alerts. (Traceability & Audit)

6. Reduce the attack surface related to the embedded browser

Context and risks

The browser embedded in a PowerBuilder application can be used to display HTML content, integrate a portal, or facilitate authentication via a web page.

These integrations are sometimes based on legacy components. Microsoft ended support for IE11 in June 2022. It now recommends using Edge in IE mode. Keeping old web controls creates a risk of vulnerabilities and the execution of unwanted content.

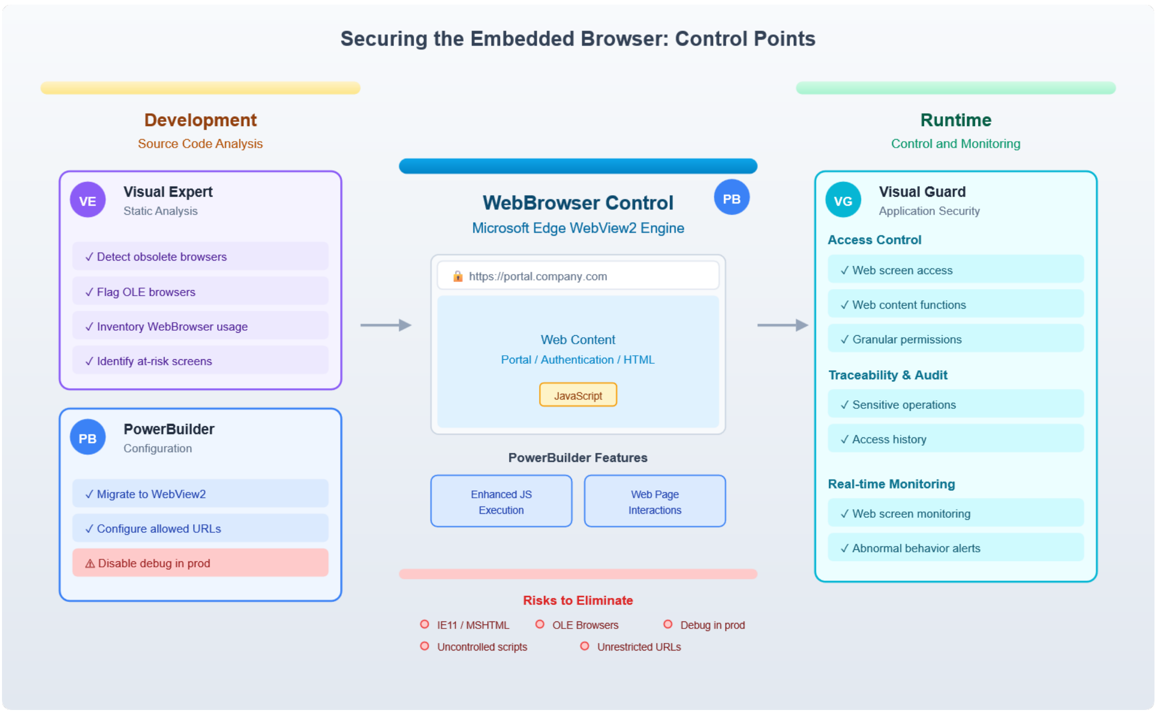
Microsoft documentation also notes that the WebBrowser control runs in 'full trust' mode and does not prevent the execution of potentially dangerous scripts or content originating from external servers.

Vulnerabilities in the MSHTML engine have already been exploited in targeted attacks, such as CVE-2021-40444, which triggered a CISA alert.

In this context, it is recommended to limit the web content accessed, isolate the component, and migrate to a modern, supported engine.

Objectives

- List the screens using a browser, the expected content, and the authorized URLs.
- Migrate to a modern browser and remove unsupported components.
- Strictly limit browsing, URL opening, and script execution, especially for content from external servers.
- Supervise exchanges between the application and web pages (JavaScript interactions) to prevent unwanted execution or access.
- Disable remote debugging in production.



Features and tools

Use the modernized WebBrowser control based on Microsoft Edge WebView2, with associated functional enhancements.	PB
Leverage WebBrowser improvements for JavaScript execution and page interaction.	PB
Enable remote debugging of WebBrowser for diagnostic purposes. This feature must be strictly controlled and disabled in production.	PB
Detect the use of an OLE browser or obsolete components, as they are more exposed to vulnerabilities and security incompatibilities.	VE
Inventory and analyze WebBrowser usage (URL opening, script execution, content manipulation) to identify at-risk screens and prioritize fixes.	VE
Restrict access to screens or functions that integrate web content.	VG
Track and audit sensitive operations associated with the browser.	VG
Monitor access to screens and functions displaying web content in real time and notify teams in the event of abnormal behavior.	VG

Compliance

This chapter supports requirements related to attack surface reduction and access control, typically found in ISO 27001 and NIST. (Security Standards & Compliance)

Evidence

- List of screens containing a WebBrowser, with hardening measures applied (authorized URLs, remote debugging disabled in production). (Supporting remote debugging in WebBrowser - What's New)
- Visual Expert report on identified web entry points and corrections made. (Detecting security vulnerabilities in PowerBuilder code)
- Visual Guard evidence of access control and auditing on these screens/functions. (Traceability & Audit)

7. Secure the build and deployment chain

Context and risks

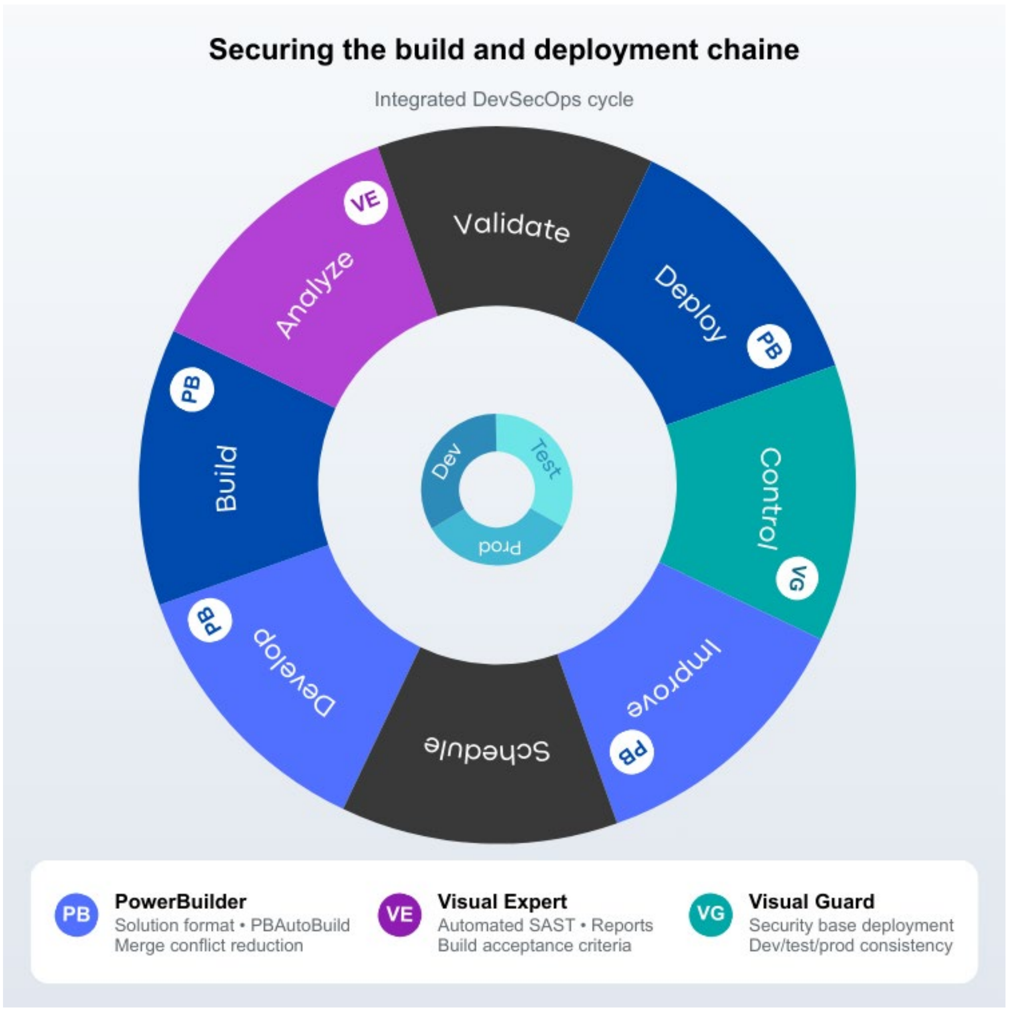
The security of an application is not limited to its source code: it also depends on the chain that produces and publishes the artifacts (build servers, scripts, dependencies, service accounts, signing keys, repositories, production processes).

When one link is compromised, the attacker can inject malicious code into an update and affect all users (shared build server, deployment service account, certificate/signature key storage, etc.).

The SolarWinds incident illustrated this scenario on a large scale, through the compromise of the manufacturing and distribution chain of a widely deployed software program.

More generally, the 2025 DBIR highlights that third parties were involved in 30% of the breaches analyzed, compared to around 15% the previous year, reinforcing the importance of controlling dependencies and shared access.

The recommended response combines integrity controls (signature, hash, SBOM), reduction of technical account privileges, and secret governance (rotation, leak detection, revocation) aligned with DevOps processes.



Objectives

- Define a standard pipeline integrating build, testing, security analysis, signing, and deployment, with explicit pass criteria.
- Make builds reproducible by controlling tool versions, dependencies, and compilation parameters.
- Secure service accounts, secrets, and signing keys used by the pipeline, and limit their privileges.
- Retain artifacts and reports associated with each version to provide audit evidence and facilitate investigations.

Features and tools

Switch to solution format to convert code to text and facilitate integration with versioning and automation tools.	PB
Use PBAutoBuild to simplify build scripts and standardize pipelines.	PB
Reduce merge conflicts and facilitate reviews and traceability with PB 2025.	PB
Industrialize static vulnerability analysis (SAST) with every build: triggering, build acceptance criteria, and dashboard.	VE
Verify that no exception is ignored and that console logging is not used in production.	VE
Automate the deployment of access control settings (permissions, roles, etc.) between environments (dev/test/prod) to reduce discrepancies and errors.	VG

Compliance

This chapter contributes to the governance and traceability expectations associated with ISO 27001 and, where applicable, internal control requirements (SOX). (Security Standards & Compliance)

Evidence

- Definition of the pipeline (build, tests, VE scan, signature, deployment) and artifact retention. (PBAutoBuild integrates with PBC - What's New)
- History of Visual Expert reports by delivered version, with corrective action tracking. (Detect security vulnerabilities in PowerBuilder code)
- Visual Guard exports (audit/permissions) associated with versions and environments. (Audit Activities) (Permission Matrix)

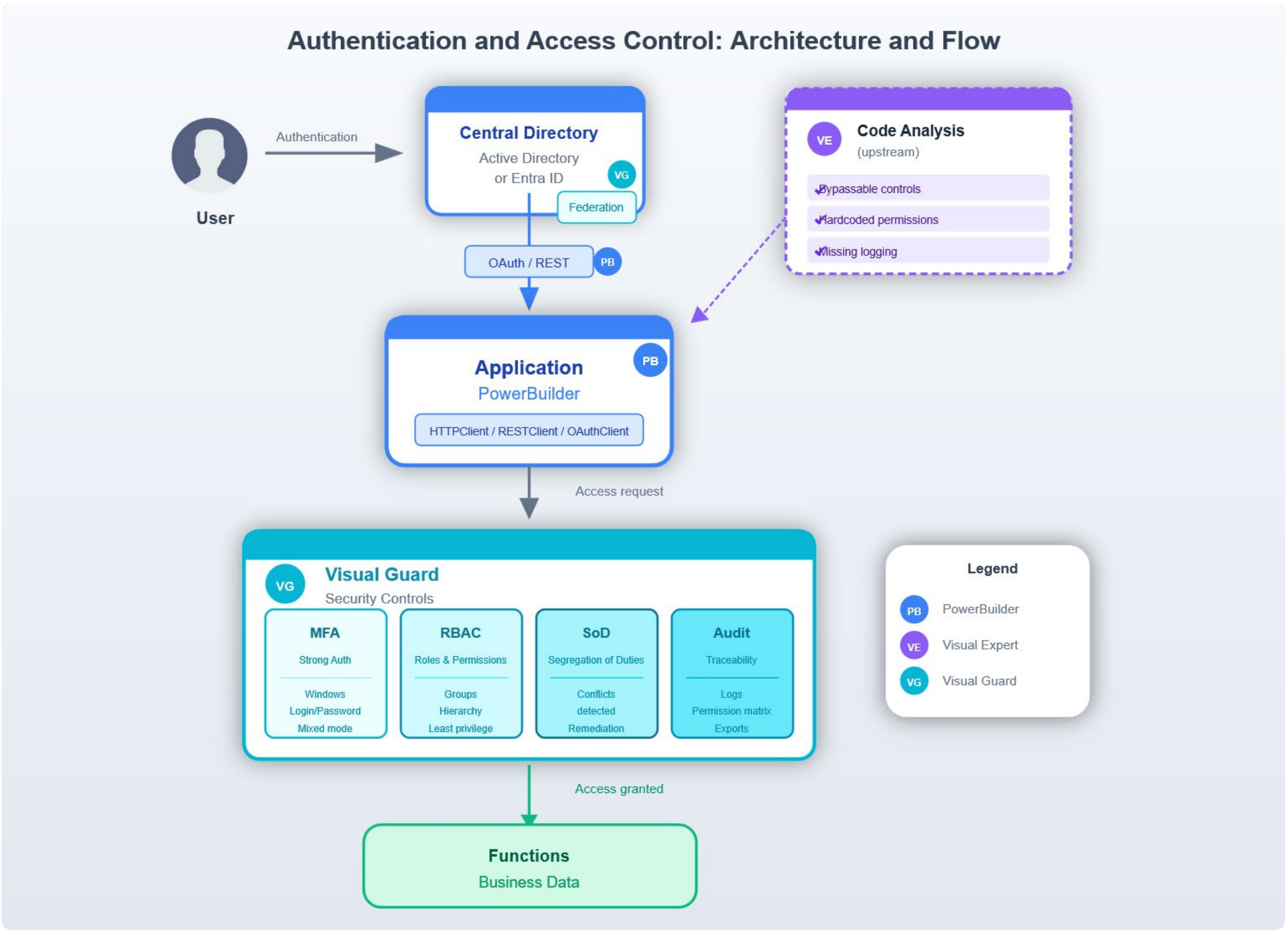
8. Strengthen authentication and access control

Context and risks

To authenticate their users, many PowerBuilder applications still use login/password accounts stored in the application database.

- Password authentication offers limited security (weak passwords, shared accounts) and introduces risk, as identity has become a major attack vector: 22% of breaches studied in the 2025 DBIR began with the use of compromised credentials.
- This approach often involves managing user accounts specific to each application (siloed accounts) and increases administration costs.
- It also increases the risk of anomalies because administrators have more accounts to manage and monitor (inactive accounts, excessive privileges, no separation of duties, etc.).

The right strategy is to centralize user accounts in a single identity store—such as Active Directory or Entra ID—and add an extra layer of protection for sensitive applications with strong authentication (MFA).



Objectives

- Centralize user identities. Reduce the use of local application accounts, for example by replacing them with Windows accounts stored in Active Directory or MS EntraID.
- Deploy strong authentication (MFA) for sensitive applications and privileged accounts.
- Model rights through consistent roles and permissions, applying the principle of least privilege.
- Implement separation of duties for critical operations and handle authorization conflicts.
- Organize periodic reviews of rights and maintain audit evidence of sensitive logins and actions.

Features and tools

Integrate modern authentication and token mechanisms when the application interacts with identity services, using PB network objects (HTTPClient/OAuth/RESTClient).	PB
Identify authentication/authorization implementations in code and detect common vulnerabilities (bypassable controls, hard-coded rights, lack of logging).	VE
Implement strong authentication (MFA) and choose, depending on the case, Windows authentication, login/password, or a mixed mode within the same app.	VG
Manage identities spread across multiple directories (federation) and structure users into a hierarchy of groups reflecting the organization, in order to delegate and industrialize the assignment of rights.	VG
Identify and correct authorization conflicts through separation of duties (SoD).	VG
Produce audit-ready reports by generating a permission matrix.	VG

Compliance

This chapter directly addresses the IAM and access governance requirements in ISO 27001, NIST SP 800-53, and PCI DSS, and is particularly relevant in the finance, healthcare, and publicly traded companies sectors. (Security Standards & Compliance)

Evidence

- Permission matrix by role/group/user and evidence of periodic reviews. (Permission Matrix)
- Documented SoD rules, list of detected conflicts, and remediation plan. (Separation of Duties (SoD))
- Audit logs of sensitive connections and operations, with retention and export. (Audit Activities)

9. Optional: migrate to a modern architecture with PowerServer

Context and risks

Some PowerBuilder applications are now accessible remotely (VPN, application gateways, virtualization), while retaining a "thick client" that connects directly to the database and relies on parameters stored on client workstations.

This model introduces certain risks, as equipment located at the network perimeter and remote access points become critical entry points. It also becomes more difficult to control, workstation by workstation, the secrets and connection parameters.

The DBIR 2025 indicates that exploitation of vulnerabilities accounts for approximately 20% of initial accesses. It highlights that those affecting remote access equipment are particularly sensitive, as only 54% are corrected within 30 days.

The solution is to reduce workstation dependency and base exposure by moving to a multi-tier architecture, where an application server exposes .NET APIs (PowerServer), with centralized identity and controls placed in the right location (authentication, logs, network segmentation).

Objectives

- Reduce direct access to the database from client workstations by centralizing access in a server layer exposing APIs.
- Centralize server-side security controls (authentication, authorization, logging) to limit dependency on client applications and local configurations.
- Standardize API authentication and token management, aligning with the organization's practices.
- Plan for gradual evolution by prioritizing the most sensitive modules.

Features and tools

Use PowerServer to evolve toward a server-side n-tier architecture and reduce direct database access from client workstations.	PB
Implement authentication mechanisms such as OAuth 2.0 or JWT in Web APIs to prevent unauthorized access.	PB
Update server components to a supported version of .Net	PB
Map the application, identify dependencies, and secure existing code before, during, and after an architecture change.	VE
Use standard tools to manage users, API access permissions, and generate audit reports.	VG
Centralize security for multiple applications to provide a comprehensive view of identities and rights, and standardize controls, logging, and audits.	VG

Compliance

This chapter is part of an approach to align with auditable and standardized architectures, which is frequently emphasized in ISO 27001 and NIST. (Security Standards & Compliance)

Evidence

- Architecture diagram (network zones, Web APIs, reverse proxy, identity) and flow documentation. (PowerServer Web APIs)
- Evidence of access controls and audits (Visual Guard) on sensitive operations. (Traceability & Audit)
- Visual Expert reports certifying vulnerability fixes prior to production deployment. (Detect security flaws in PowerBuilder code)

10. Bring applications into compliance with modern standards

Context and risks

In regulated sectors (finance, healthcare, listed companies), the goal is not only to strengthen security.

These organizations must demonstrate that their applications comply with modern standards. They must also carry out concrete and verifiable checks: who can access sensitive functions, what rights have been granted, what actions have been taken, and what measures protect critical data.

This requirement has been reinforced by transparency obligations: in the United States, for example, the SEC requires listed companies to report certain "material" cybersecurity incidents according to a highly regulated procedure.

Furthermore, the global average cost of a data breach reached $4.88 million in 2024, turning a compliance gap into a direct financial risk.

In this context, organizations must now systematize controls and produce evidence: reports, logs, access reviews, and change traceability.

To avoid duplication and facilitate audit preparation, this chapter links the features described above with compliance requirements.

Objectives

- Define the applicable standards and the expected scope of compliance for the application (internal and external requirements).
- Translate these requirements into measurable controls, then into evidence for audits.
- Establish a repository of evidence (reports, logs, access reviews, etc.).
- Formalize governance (access reviews, exception management, SoD conflict handling) and prepare a standardized audit file.

Features and tools

Support frequent requirements: code signing, DB/driver connection encryption, secure network protocols, and OAuth/REST integration capabilities.	PB
Provides repeatable and versioned analyses (particularly on PowerBuilder security rules), which are useful for demonstrating a vulnerability reduction and continuous improvement approach.	VE
Automate security checks and reports and compliance with modern standards: IAM, RBAC, separation of duties, traceability, auditing.	VG
Document "who has access to what" by publishing a permissions matrix.	VG
Rely on a repository of inspection rules to generate reproducible results for detecting vulnerabilities in source code.	VE

Compliance

Visual Guard publishes a map of supported standards (ISO 27001, NIST SP 800-53, NIST SP 800-63, CIS Controls, PCI DSS, GDPR, etc.) and specifies the associated mechanisms (MFA, RBAC, SoD, logging, access review). (Security Standards & Compliance)

Evidence

- Correspondence matrix: control / requirement / functionality (PB, VE, VG) / evidence produced. (Security Standards & Compliance)
- Standard report sets: VE scans, permission matrix exports, audit logs, signature procedures. (Detecting security vulnerabilities in PowerBuilder code) (Permission Matrix) (Using PowerBuilder code signing options)
- Governance process: frequency of access reviews, exception management, SoD conflict handling. (Separation of Duties (SoD))

Checklists for securing a PowerBuilder application

These checklists offer a pragmatic approach: actions applicable to most contexts, followed by optional actions to be activated depending on the organization's architecture and regulatory constraints.

Checklist A - Generic measures (recommended in most cases)

Chapter	**Measure**
Cross-cutting (prerequisites)	Inventory applications, environments, dependencies, and flows (workstations, servers, databases, etc.).
	Classify the data handled and formalize the associated protection requirements.
	Establish a remediation process (prioritization, target timelines, validation, tracking).
	Patch and keep exposed components up to date (OS, databases, middleware, libraries, remote access).
	Formalize an incident response plan and test DR/BCP (restore, recovery).
2. Executables and components	Create a reproducible, versioned build process linked to an identifiable release.
	Sign all executables, libraries and deployment packages using a company-approved certificate.
	Verify artifact integrity before distribution (hash/fingerprint) and record the result.
	Track deployed versions (hash, date, owner) and keep history.
	Restrict and audit publishing and administration rights related to deployment.
	Scan PowerBuilder code before release to identify vulnerabilities and bad practices.
	Detect and remove hard-coded secrets (IDs, passwords, keys, IPs) from code and scripts.
3. Protect data	Identify sensitive data and where it resides (database, files, exports, logs, backups).
	Enable TLS on the DB server and PB DB drivers to use TLS 1.2+, including certificate validation.
	Encrypt sensitive data at rest when required (database, files, exports, backups).
	Protect encryption keys (storage, access control, rotation, revocation).
	Encrypt connection properties. Generate encrypted connection strings (no clear-text secrets).
	Detect and eliminate weak ciphers (e.g., DES/3DES). Enforce robust modes.
	Detect and eliminate obsolete hashes (e.g., SHA-1/MD5) and enforce robust alternatives.
	Verify cryptographic strength (key sizes, operating mode, padding) against the security policy.
	Reduce exposure to sensitive data by tightly limiting access through roles/permissions.
4. Network protocols	Inventory network flows and the protocols actually negotiated (TLS versions, suites, certificates).
	Remove obsolete protocols. Align TLS configuration with the company's policy.
	Certificate validation and error handling (no bypasses or silent downgrades).
	Implement mutual TLS authentication (mTLS) when required (internal/partner APIs).
	Test compatibility with proxies, gateways, and network protections (RESTClient / HTTPClient).
	Detect non-compliant or legacy network calls and prioritize their replacement.
5. Exchanges with external services and APIs	Inventory integrations (APIs, internal services, SMTP) and the data exchanged.
	Prefer REST over SOAP/INET for integrations (RESTClient).
	If SOAP is required, use HTTPClient with TLS 1.2+ and strong authentication. Avoid legacy SOAP client.
	Use token-based authentication rather than usernames and passwords, with HTTPClient / OAuthClient.
	Strictly limit privileges for tokens and technical accounts (scopes, permissions).
	Remove hard-coded secrets and organize storage, rotation and revocation (per environment).
	Detect and fix injection risks (SQL, OS commands, paths) on inputs and parameters.
	Validate inputs and encode outputs on exposed flows (services, APIs, files, emails).
	Trace sensitive operations (exports, sends, critical actions) plus monitoring/alerting.

Chapter	Measure
6. Embedded browser	Inventory screens embedding a browser and define expected content and allowed URLs.
	Migrate to a modern, supported browser engine and remove obsolete components.
	Limit browsing, URL opening and script execution for untrusted content.
	Govern JavaScript interactions (application bridges) to prevent unwanted execution.
	Disable remote debugging in production and reserve it for controlled diagnostics.
	Restrict access to "web" screens.
	Monitor web access and trigger notifications on abnormal behavior (Traceability & Audit).
7. Build and deployment	Define a standard pipeline (build, tests, analysis, signing, deployment) with explicit pass criteria.
	Move to solution format to simplify versioning and automation (Solution).
	Move to PB 2025+ to reduce merge conflicts and improve traceability.
	Make builds reproducible (versions, dependencies, parameters). Retain artifacts and reports per version.
	Secure pipeline technical accounts (least privilege, separation of roles, audit).
	Secure pipeline secrets and keys (secure storage, restricted access, rotation).
	Industrialize SAST analysis on every build and block release if critical rules fail.
	Avoid risky practices in production (e.g., console logging) and do not ignore exceptions.
	Standardize deployment of security settings between dev/test/prod (avoid discrepancies).
8. Authentication and access control	Centralize identity (AD/Entra ID) and reduce local application accounts.
	Enable MFA for sensitive applications and privileged accounts.
	Model rights through roles and permissions aligned with least privilege.
	Centralize authentication, authorization and logging via a dedicated server (Identity Server).
	Implement separation of duties (SoD) for critical operations and address conflicts.
	Organize periodic access reviews and retain evidence.
	Produce an audit-ready permission matrix (who has access to what).
	Log sensitive logins and actions (who, what, when, where) and centralize monitoring.
10. Compliance with modern standards	Define applicable standards and the application's compliance scope.
	Translate requirements into measurable controls and expected evidence (reports, logs, access reviews).
	Establish an evidence repository and retain history per version/environment.
	Standardize governance (access reviews, exception management, handling SoD conflicts).
	Build a reusable audit pack linking requirements, controls, tools and evidence.

Checklist B - Optional measures depending on the architecture and environment

Chapter	Measure
5. Exchanges with external services and APIs	If the application consumes APIs: strong authentication and rotation of keys/tokens (OAuth 2.0)
	If the application consumes APIs: limit token scopes and privileges (OAuthClient)
	If emails: use native email support and modern authentication (SMTP Client / XOAUTH2).
	If emails: secure relays (auth, TLS), limit attachments, trace sensitive sends (XOAUTH2)
6. Embedded browser	If Web/HTML components: control content, limit untrusted scripts (WebBrowser)
	If Web/HTML components: replace legacy engines with a supported engine (WebView2)
7. Build and deployment	If industrialization: standardize build scripts and pipeline orchestration (PBAutoBuild)
	If stronger QA: build acceptance criteria based on analysis results (SAST)
8. Authentication and access control	If authorization conflicts: define SoD rules and remediation (Separation of Duties (SoD))
	If complex organization: a user-group hierarchy mirroring the organization to delegate rights.
	If identities are spread across multiple directories: implement identity federation.
	If the organization prepares audits: generate and use a permissions matrix (Permission Matrix)
9. Modern architecture with PowerServer	If the database is accessible from clients: migrate to an n-tier architecture with PowerServer
	If the application exposes/consumes APIs: standardize API authentication (OAuth 2.0)
	If the application exposes/consumes APIs: use standard tokens, limit unauthorized access (JWT)
	Centralize server-side controls (authentication, authorization, logging).
	Plan a progressive evolution by prioritizing the most sensitive modules (Progressive migration).
	Update server components to a supported .NET version (.NET).
	Administer API access permissions and produce audit reports (Permissions / Audit Activities).
10. Compliance with modern standards	If strong requirements (finance, healthcare, etc.): compliance governance and formal controls (Audit Activities)
	If strong requirements: industrialize audit evidence and its retention (Permission Matrix)

FAQ

1) Where should you start to secure an existing PowerBuilder application?

Start with a high-level view: inventory the components (executable, DLLs, OCXs, scripts), the flows (workstation ↔ server ↔ database), sensitive data, and dependencies. Then run a SAST scan on the PowerBuilder code to quickly identify vulnerabilities and bad practices, and prioritize remediation. Finally, put the "foundations" in place: code signing, encryption in transit, access control, logging, and audit evidence.

2) What are the most common vulnerabilities found in PowerBuilder applications?

Common findings include hard-coded secrets (usernames, passwords, keys), legacy network calls, access controls implemented "case by case" and difficult to audit, insufficient input validation (SQL/command/path injection risks), and logging that is too weak to support investigations. A PowerBuilder-focused SAST scan is an effective way to make these risks visible and target remediation.

3) How do you encrypt database connections from PowerBuilder?

The goal is to encrypt data in transit between the workstation, any application servers, and the database. Verify the TLS configuration (versions, cipher suites, certificates) on both the client and server sides. Depending on the database, enable the strictest encryption modes available and test compatibility in environments with proxies, gateways, or hardened network policies.

4) What is the difference between "in transit" and "at rest" encryption in a PowerBuilder application?

Encryption in transit protects data on the network (interception, tampering). Encryption at rest protects stored data (database, files, exports, logs, backups) in case of theft, unauthorized access, or compromise. The two are complementary: an encrypted channel does not prevent leakage via an unprotected local export, and encrypted storage does not prevent network sniffing if communications are not encrypted.

5) Which encryption and hashing algorithms should be avoided?

Avoid algorithms and functions considered weak or obsolete (e.g., DES/3DES, MD5, SHA-1), as well as inappropriate modes and padding. Prefer modern algorithms with robust parameters (key size, mode of operation) and proper key management (storage, rotation, revocation). Consistency is key: "the right algorithm" + "the right parameters" + "the right usage."

6) How do you secure the publishing and installation of PowerBuilder executables?

Establish a chain of trust: reproducible and versioned builds, systematic signing of artifacts, integrity verification (hash), and traceability of deployed versions (date, owner, fingerprint). Restrict and audit publishing/deployment privileges. The goal is to reduce supply-chain compromise risk and make investigations easier.

7) Why is the build/deployment pipeline a critical security point?

Because compromising the pipeline can inject malicious code into a "legitimate" release and distribute it at scale. Secure technical accounts, secrets, signing keys, and repositories. Industrialize SAST at every build, retain artifacts and reports, and define clear release acceptance criteria before production. "Code-only" security is not sufficient.

8) How do you implement SSO and MFA for a PowerBuilder application?

The principle is to centralize identity (enterprise directory) and apply stronger authentication mechanisms, especially MFA for sensitive applications and privileged accounts. For PowerBuilder applications, this translates into a consistent IAM approach: centralized authentication, roles/permissions management, logging, and the ability to produce evidence (access reviews, reports).

9) How do you control permissions and prepare for an access review?

You need a roles/permissions model aligned with least privilege and the ability to produce a complete, usable view of entitlements. Run periodic access review campaigns, address exceptions, and retain approval evidence. A “permission matrix” (or equivalent) simplifies audits and speeds up reviews.

10) What is separation of duties (SoD) and why does it matter in a PowerBuilder application?

SoD prevents one person from holding incompatible rights (for example, creating and approving a payment, or administering and auditing). It reduces internal fraud risk and strengthens compliance. In a PowerBuilder application, this means modeling roles, defining SoD rules, detecting conflicts, remediating them, and keeping audit evidence.

11) How do you link technical measures to compliance requirements (ISO, NIST, PCI, HIPAA, SOX)?

Start by defining the applicable standards and scope. Then translate requirements into measurable controls and into evidence: scan reports, logs, access reviews, permission matrix, SoD rules, signing procedures, TLS configuration, and so on. The most useful deliverable is a reusable “Requirement → Control → Tool → Evidence” mapping for every audit.

Bibliography – sources cited in this guide

- The 3CX incident in 2023 — CISA (DHS)
- 133 malicious Windows drivers — Sophos; Author: Andrew Brandt
- Security - What's New — Appeon
- Detecting security vulnerabilities in PowerBuilder code — Novalys (Visual Expert)
- Permissions — Novalys (Visual Guard)
- Security Standards & Compliance — Novalys (Visual Guard)
- Audit Activities — Novalys (Visual Guard)
- Verizon 2025 DBIR – Executive Summary — Verizon; Author: Verizon
- CISA – Ransomware Guide — CISA (DHS)
- The MD Anderson Case — U.S. HHS
- Secure Connection Encryptor - What's New — Appeon
- Supports Strict encryption for SQL Server - What's New — Appeon
- Permission Matrix — Novalys (Visual Guard)
- NIST SP 800-52r2 — NIST; Author: Kerry A. McKay; David A. Cooper
- PCI DSS — PCI SSC
- Supports HTTP/2 - What's New — Appeon
- PowerBuilder 2022 - What's New — Appeon
- Supports two-way TLS authentication - What's New — Appeon
- How to use Identity Server API? — Novalys (Visual Guard)
- Lack of object-level access controls — OWASP
- FBI IC3 2024 — FBI / IC3; Author: FBI Internet Crime Complaint Center (IC3)
- The Optus incident (2022) — Reuters; Author: Reuters
- Native email support (SMTP Client) - What's New — Appeon
- Enhanced RESTClient object - What's New — Appeon
- Traceability & Audit — Novalys (Visual Guard)
- Using Edge in IE mode — Microsoft
- Microsoft documentation — Microsoft
- CVE-2021-40444 — CISA (DHS); Author: CISA
- WebBrowser engine upgrade - What's New — Appeon
- WebBrowser enhancements - What's New — Appeon
- Supporting remote debugging in WebBrowser - What's New — Appeon
- The SolarWinds Incident — CISA (DHS)
- Ultra-fast compiler and new solution format - What's New — Appeon
- DBIR 2025 — Verizon
- Separation of Duties (SoD) — Novalys (Visual Guard)
- PowerServer Web APIs — Appeon
- Architecture - PowerServer Help — Appeon
- Reporting "material" cybersecurity incidents — U.S. SEC; Author: Erik Gerding
- Global average cost of a data breach reaches $4.88 million — www.ibm.com

Let’s discuss your project

Have questions about the security of your PowerBuilder Applications?

Our teams are available to discuss your challenges, assess your context and support you though the process.

EMAIL

contact@novalys.net

TELEPHONE

+33 1 41 31 82 82

WEB

www.novalys.net • www.visual-expert.com • www.visual-guard.com