The PTC Data Management Strategy for Pro/INTRALINK® Customers

Purpose

This white paper provides detailed information to help existing Pro/INTRALINK® customers understand PTC's Pro/ENGINEER® data management strategy and future product plans. The target audiences for this white paper are system administrators, engineering managers, product development process owners, and IT planners.

Overview

Having been widely embraced within our customer base, Pro/INTRALINK is one of PTC's most successful products and is viewed as a very mature and powerful solution. With production-proven Pro/ENGINEER workgroup data management capabilities, Pro/INTRALINK is the industry-standard solution for managing concurrent design teams and the power of Pro/ENGINEER associativity. Pro/INTRALINK understands and manages all Pro/ENGINEER files and relationships so that engineers can concentrate on innovative product design. The result: more control, higher quality designs, and happier engineers. However, as their needs evolve, many customers are beginning to realize that the Pro/INTRALINK 3.x solution has some technology constraints.

While the current client-server based solution very effectively manages a local Pro/ENGINEER workgroup environment, it is has become less common for engineers to design products entirely within their four walls. Increasingly, engineering teams are dispersed, requiring a means to efficiently request and deliver data to a globally shared database. Therefore, wide area network (WAN) performance must be at its highest. Furthermore, engineers are encouraged and expected to share information with other organizations both inside and outside their company. Today, marketing, sourcing, design partners, manufacturing partners, and customers are all involved in the process of product development. These distributed performance and collaboration requirements can most effectively be met with a modern Web-based architecture.

Globalization has also made it challenging for our customers to collect and manage in a single system all the data that represent a product. This "digital product" is typically a company's most strategic asset; it is a comprehensive collection of electronic information including mechanical and electrical CAD files; design, quality, and manufacturing specifications; market and technical product requirements; software modules; and documentation and other media used to define and communicate the product and test its behavior electronically. Moreover, product development processes such as portfolio planning, top down planning and design, change management, release to manufacturing, and supplier and component management are becoming increasingly cross-functional. Focused on managing Pro/ENGINEER data only and the processes of the Pro/ENGINEER workgroup, Pro/INTRALINK does not readily accommodate the requirement for a single source of data to manage the complete digital product nor can it address the growing cross-functional nature of product development.

At the same time, PTC has spent the last 6 years investing heavily to address these trends and has delivered many of the required capabilities through the Windchill® solutions. Windchill is PTC's premier solution

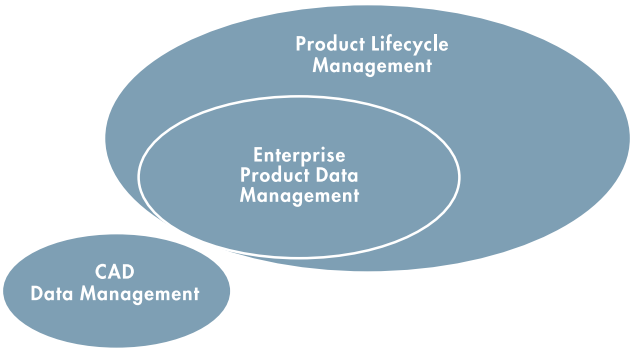


Figure 1. Customer needs addressed by two products.

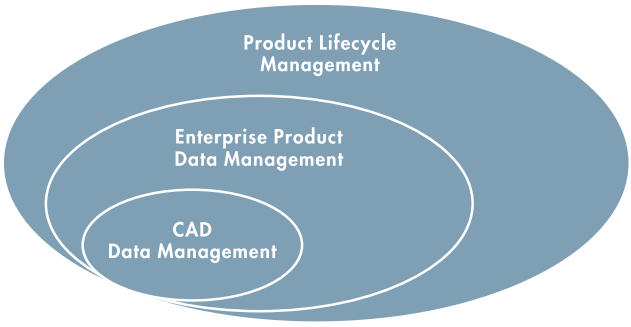


Figure 2. Customer requirements met with a single, expandable, scalable solution built on the Windchill 8.0 platform.

family designed to address the critical requirements for product lifecycle management that exist within the manufacturing industry. Windchill PDMLink is a pre-configured enterprise product data management (PDM) solution, which delivers a powerful set of workgroup and enterprise PDM capabilities blended with additional CAD system integrations, visualization services, and pre-defined engineering change and configuration management processes and workflows. Windchill PDMLink employs a native Web architecture that allows customers to leverage their existing investments by providing broad access to Pro/ENGINEER information while enabling cross-functional and cross-enterprise participation in product development. Windchill PDMLink is the foundation for product life cycle management (PLM) because it establishes a system of record for all product related information. It is therefore, also, a core component of PTC's Product Development System (PDS).

While exciting, these capabilities are largely inaccessible to Pro/INTRALINK customers (see Figure 1) and some have expressed concern that the product roadmap for Pro/INTRALINK is unclear. Many customers have chosen to deploy Pro/INTRALINK and Windchill PDMLink together using the Pro/INTRALINK Gateway as a means of joining the two solutions. However, this type of deployment can be complex.

Given the strong Pro/ENGINEER data management capabilities of Pro/INTRALINK and the robust distributed process support of Windchill PDMLink, a merger of the products would seem ideal. With

Windchill 8.0 and Pro/INTRALINK 8.0, PTC has dedicated an entire software release to do just this. As illustrated in figure 2, PTC is delivering Pro/INTRALINK 8.0 on the industry leading Windchill architecture. In addition to providing the same core Pro/ENGINEER workgroup data management capabilities that Pro/INTRALINK customers have come to expect, the new architecture of Pro/INTRALINK 8.0 will result in a more integral experience for Pro/ENGINEER Wildfire users. Furthermore, this new release will unify the Pro/ENGINEER data management capabilities of both Pro/INTRALINK and Windchill PDMLink providing Windchill PDMLink customers with the same robust Pro/ENGINEER data management capabilities. As a result, Pro/INTRALINK customers will have a direct path to PTC's Product Development System (PDS) through an easy upgrade to Windchill PDMLink

While this Pro/INTRALINK 8.0 release and the associated Pro/ENGINEER data management strategy is a very exciting development, as with any technology change it is natural for customers to be concerned. To help customers adopt this new version of Pro/INTRALINK, PTC is committed to provide:

- Superior product capabilities and performance–Customers can expect Pro/INTRALINK 8.0 and beyond to continue to deliver enhanced Pro/ENGINEER workgroup data management capabilities and improved individual and process productivity.
- Easy and affordable upgrade path–PTC has developed service offerings and improved data migration tools for easier adoption of new versions of Pro/INTRALINK, ensuring a successful transition for customers of all sizes.
- Investment protection–As with past new releases, Pro/INTRALINK 8.0 will be available free of charge to maintenance paying customers, thus protecting our customers investments to date.
- Plenty of time–Recognizing that Pro/INTRALINK 8.0 is a considerable change, PTC has extended the normal support period for Pro/INTRALINK 3.4 to provide sufficient time for customers to make a measured transition to the new architecture. This extended support will provide customers with maintenance releases of Pro/INTRALINK 3.4 through June 2008.

PTC has a long-term commitment to provide a high quality, high performance, and fully capable Pro/ENGINEER workgroup data management solution based on the modern Windchill architecture. This architecture provides a solid technical foundation for product enhancements that will carry the Pro/INTRALINK product and our customers well into the future.

Pro/INTRALINK 8.0

Pro/INTRALINK 8.0 is the next generation of PTC's Pro/ENGINEER workgroup data management solution. Like Pro/INTRALINK 3.x, Pro/INTRALINK 8.0 includes the same core Pro/ENGINEER workgroup data management capabilities that customers have come to expect including:

- **Pro/ENGINEER versioning & vaulting:** The ability to track different versions and iterations of Pro/ENGINEER designs and store these design files in a secure database.
- **Workgroup collaboration:** A managed local working environment (workspace) that is aware of designs being used by other engineers and that provides users with tools to update their Pro/ENGINEER session with new versions of designs.
- **Basic lifecycle management:** Tools to define and advance the maturity of a design.
- **Basic document management:** The ability to version and vault non-Pro/ENGINEER files.
- **Basic configuration management:** The ability to create baselines and "as stored" configurations that identify the specific versions and iterations of different Pro/ENGINEER models that should be used together.
- **Content replication:** The ability to improve wide area network (WAN) performance through the use of distributed file vaults that contain Pro/ENGINEER file content. Note: like Pro/INTRALINK 3.x, this capability is only available with Pro/INTRALINK Multi-site.
- **Basic visualization:** The ability to access a lightweight graphical preview of Pro/ENGINEER data stored in the database without first retrieving the data into Pro/ENGINEER.
- **Optional advanced visualization:** The ability to purchase and deploy expanded visualization capabilities providing broader access to Pro/ENGINEER viewables as well as measurement, annotation, and markup capabilities.
- **Searching:** Querying tools that allow users to search the Pro/INTRALINK database to easily find designs.
- **Bills of Material and Relationship reporting:** Standard reports to view the structure and relationships of Pro/ENGINEER data stored in the Pro/INTRALINK database.
- **Flexible packaging:** PTC will continue to offer Pro/INTRALINK Single-Site and Pro/INTRALINK Multi-Site on a concurrent user basis.

Pro/INTRALINK 8.0 Capabilities Beyond Pro/INTRALINK 3.x

In addition to these core Pro/ENGINEER data management capabilities, Pro/INTRALINK 8.0 delivers many new capabilities that are not available in Pro/INTRALINK 3.x. These new capabilities include expanded support for distributed product development (including security and performance), tighter integration with Pro/ENGINEER, improved visualization, expanded lifecycle management, enhanced document management, improved support for non-engineering users, enhanced reporting, and new archive and restore capabilities. More detailed information on these new capabilities is provided below.

Support for Distributed Product Development

Pro/INTRALINK 8.0 delivers significant improvements for supporting a distributed product development environment. These improvements include improved WAN performance, scalability, security, and expanded cross-locale support.

WAN Performance and Replication

Pro/INTRALINK 8.0 delivers the following enhancements not available in Pro/INTRALINK 3.X for improved WAN performance.

- Meta-data compression: This feature accelerates the transfer of family-tables, assemblies with patterns, and large assemblies.
- Multi-threaded downloading and uploading: Multi-threaded operations enable Pro/INTRALINK 8.0 to upload and download multiple Pro/ENGINEER files in parallel and can be configured to optimize the usage of client, and server to shorten CAD data transfer times.
- Background Uploading (and Check in): Background uploading allows users to continue to work in Pro/ENGINEER while upload and check-in operations are being performed.
- Offline Work Capability: Offline work capability allows Pro/ENGINEER users to work offline when the Pro/INTRALINK 8.0 server is unavailable. More specifically, users can continue working in Pro/ENGINEER and continue accessing their Pro/INTRALINK workspaces even if the network connection to the server is interrupted. When the server becomes available, a user can choose to "work online" and his work is automatically synchronized with the Pro/INTRALINK server upon re-connection. This new powerful network fault tolerance capability improves the productivity of Pro/INTRALINK users connecting over unreliable wide area networks or who prefer, instead, to periodically access the Pro/INTRALINK server over a WAN or corporate VPN.
- Automated and scheduled Content replication with local upload: Both Pro/INTRALINK 3.x and Pro/INTRALINK 8.0 provide the means to copy or replicate Pro/ENGINEER files to "replica servers" to enable remote users to more quickly download Pro/ENGINEER files from local servers instead of from the central Pro/INTRALINK server. In addition to this, Pro/INTRALINK 8.0 adds the ability for remote users to also upload files to replica servers, decreasing upload and check in times. Furthermore, Pro/INTRALINK 8.0 adds scheduling and more granular replication rules to automate content replication. Pro/INTRALINK 8.0 compresses content during download and uses HTTP or HTTPS (optionally) providing a more efficient, scalable, fault tolerant, and secure communication protocol. These new content replication capabilities improve the productivity of Pro/ENGINEER users and system administrators, optimize network resource usage, and support secure data transfer.

Scalability

The scaling options for a Pro/INTRALINK 3.X implementation are limited to increasing system memory and adding additional CPUs. Through the use of proven Web-based technologies and system components, Pro/INTRALINK 8.0 provides additional options for expanding an implementation to support additional users and increased workload. Furthermore, support for Web farming (functionality redundancy) and fail-over maximizes system availability. By leveraging resource redundancy, load balancing, and caching, system performance can remain constant as user load scales.

Security and Access Control

While Pro/INTRALINK 3.x may be deployed to provide Intranet-level security, Pro/INTRALINK 8.0 offers multiple deployment options including extremely secure models with multiple firewalls and security zones. Pro/INTRALINK 8.0 allows for deployment across network zones and firewalls, integration with a company's enterprise LDAP server and system access controls. Furthermore, audit-reporting capabilities are also provided.

Additional system security features in Pro/INTRALINK 8.0 include:

- Optional encrypted data transfer between client and server
- Hardware SSL/key encryption
- Split Web/application configuration
- External LDAP server integration
- Single sign on

Both Pro/INTRALINK 3.x and Pro/INTRALINK 8.0 provide multiple levels of access control. Application level access control is provided through username and password logon. With Pro/INTRALINK 8.0, domain-based access control is provided for objects in a given domain (a more flexible notion of a Pro/INTRALINK 3.X folder) using users, groups, and roles. Maturity-based access control is provided based object Lifecycle State or Release Level. In addition to these three levels of access control, Pro/INTRALINK 8.0 adds support for external LDAP servers and Instance-based access control. Instance-based access control can be used to override domain-based access control to grant additional permissions to individual objects.

Furthermore, Pro/INTRALINK 8.0 adds a new level of accountability with audit reporting capabilities. When auditing is enabled, Pro/INTRALINK 8.0 tracks system activity by monitoring:

- Access to products and libraries (NOTE: A Pro/INTRALINK 8.0 product or library is analogous to a top level folder in Pro/INTRALINK 3.X that contains everything for a product or a complete library of components)
- Individual user activity
- Changes to teams and access controls

Cross-Locale Support

Pro/INTRALINK 8.0 provides improved support for distributed product development through expanded cross-locale support. With Pro/INTRALINK 3.x, customers have limited ability to connect to a Pro/INTRALINK Commonspace with versions of Pro/ENGINEER running in different languages. More specifically, Pro/INTRALINK 3.x supports the use of non-English data servers only with clients with the same language environment and English data servers only with English and Western European language clients. For example, customers can use a French data server only with clients that are set to run in French while English data servers can only be used with English, French, German, Italian, and Spanish clients.

Server OS and Pro/INTRALINK 8.0 Locale	Client OS, Pro/ENGINEER Version and Browser Locale Pro/INTRALINK	Result
Locale 1 (e.g. Japanese)	Locale 1 (e.g. Japanese)	Supported
Locale 1 (e.g. Japanese)	Locale 2 (e.g. English)	Supported Note: The Universal Transformation Format (UTF) encoding of non-English attribute names and values must be less than 80 characters to avoid data corruption

Table 1. Pro/INTRALINK 8.0 cross-locale support summary

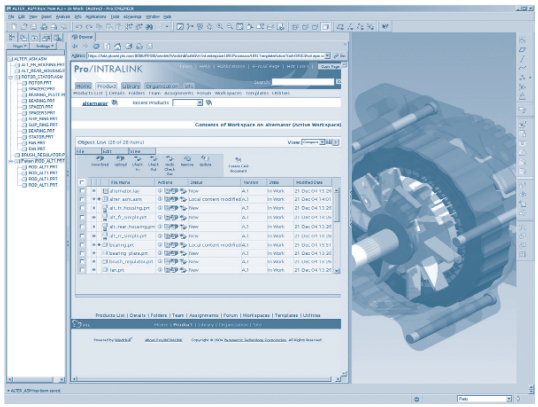


Figure 3. Screen shot of Pro/INTRALINK 8.0 running inside a Pro/ENGINEER Wildfire 2.0 browser

Pro/INTRALINK 8.0, on the other hand, provides expanded support. Detailed in table 1, this expanded support allows customers to use non-English data servers with different language clients as well as non-European language clients with English data servers.

Integration with Pro/ENGINEER User Environment

With Pro/INTRALINK 8.0, Pro/ENGINEER users can perform all of their data management commands from within the Pro/ENGINEER Wildfire user interface (Figure 3). Common Pro/ENGINEER data management functions such as finding, downloading, and updating models are fully integral with Pro/INTRALINK 8.0 in a way that makes Pro/INTRALINK 8.0 almost transparent to the Pro/ENGINEER user. Other features such as graphical previews, drag and drop, embedded hyperlinks, and a Web-native user interface create an environment that provides the Pro/ENGINEER user with finger tip access to comprehensive data and configuration management capabilities of Pro/INTRALINK. While providing access to the customer's own Pro/INTRALINK system, the same user interface also provides access to other Web-based collaboration tools and online parts catalogs.

This tighter integration with Pro/ENGINEER simplifies many Pro/ENGINEER data management tasks and in many cases streamlines the operations. In fact, for common tasks such as check in, search and download, rename, checkout/lock, import, and create new workspace, Pro/INTRALINK 8.0 reduces the total number of mouse clicks by an average of 40%.

Visualization

Both Pro/INTRALINK 3.x and Pro/INTRALINK 8.0 include built-in Pro/ENGINEER previewing capabilities. With Pro/INTRALINK 3.x these capabilities are accessible from the Pro/INTRALINK Workspace and Commonspace browser. With Pro/INTRALINK 8.0 dynamic previewing of Pro/ENGINEER models is provided in the Pro/ENGINEER Wildfire 2.0 embedded browser.

Optional advanced visualization capabilities can be added to Pro/INTRALINK 8.0 through the use of PTC's ProductView™, Realizer, and Composer. These advanced capabilities include:

- Rich viewing and markup of models, drawings, images
- Optional legacy documents and PDF viewing and markup
- Pro/ENGINEER Wildfire 2.0 annotation feature support
- Real-time collaboration between multiple ProductView users
- Advanced 3D model interrogation from accurate, yet compact, geometry
- Optional Realizer module provides interference checking, animation creation, and interactive mechanisms
- Optional Composer module provides interactive creation and editing of assembly sequences

Customers upgrading from Pro/INTRALINK 3.x and the Division Graphics server to Pro/INTRALINK 8.0 are entitled to leverage the advanced visualization capabilities provided with ProductView. By upgrading to Pro/INTRALINK 8.0, Division Graphics server customers will see the following improvements:

- 3D thumbnail viewing
- Server-enforced watermarking
- Automatic viewable replication
- Client-side viewable creation
- Improved accuracy for metadata synchronization
- Publishing priority control
- Improved system architecture
  - -Single database
  - -Improved scalability
  - -More robust infrastructure
  - -Improved administration tools
  - -More efficient publishing of large assemblies

Lifecycle Management

Like Pro/INTRALINK 3.x, Pro/INTRALINK 8.0 includes lifecycle management tools (known as Release Levels and Release Procedures in Pro/INTRALINK 3.x) to define and advance the maturity of a design.

Moreover, Pro/INTRALINK 8.0 adds configuration rules that provide greater flexibility and control over how design content progresses and is managed throughout all phases of the product development lifecycle. At each phase of the lifecycle, different access control rules and different versioning schemes can be enforced to provide precise control over who has access to the data and how revisions are tracked.

These capabilities provide many important benefits including:

End-user benefits

- Task notification integrated with corporate email
- Flexible additions to approval groups
- Web-based form for easy access
- Viewable access from promotion form for non-Pro/ENGINEER users (with ProductView option)

Administrative benefits

- More flexible lifecycle (release scheme) definition
- More flexible promotion criteria
- Pre-defined rules for "set state" behavior
- Pre-defined rules for revise behavior
- Multiple version number schemes

Document Management

With Pro/INTRALINK 8.0, customers also have access to expanded document management capabilities. These capabilities provide customers with new options for managing non-Pro/ENGINEER files and include the ability to define different types of documents (e.g. specifications, requirements, test results), specify different sets of attributes appropriate for each document type, and search on document objects based on the document type. Furthermore, Pro/INTRALINK 8.0 introduces the notion of "secondary content" for managing files that do not need to be independently lifecycle managed. This new feature makes it possible to vault additional electronic files as secondary content to a primary electronic file. For example, customers that use Excel® to define Pro/ENGINEER family tables can manage the Excel file inside the same database object that stores the underlying Pro/ENGINEER file.

Support for Non-Engineering Users

With Pro/INTRALINK 3.x, non-engineering users must use the Pro/INTRALINK client to access information stored in the Pro/INTRALINK database. This client, however, was not designed for casual non-engineering users and requires a separate installation. Pro/INTRALINK 8.0, on the other hand, is an intuitive Web-based application designed for both engineering and non-engineering users. With Pro/INTRALINK 8.0, non-Pro/ENGINEER users do not need to install and use a heavy client to access product information or manage documents. Instead, they can access information right through their standard Web-browser.

Reporting

Pro/INTRALINK 8.0 provides enhanced reporting tools delivering information in a more valuable format and improving flexibility. As expected, Pro/INTRALINK 8.0 continues to offer reports for model relationships, family tables, and model structures. In addition to these reports, Pro/INTRALINK 8.0 introduces new reports for rename history, save as history, and location history. Furthermore, expanded capabilities are provided for difference reporting, and creating custom reports.

Archive and Restore

Both Pro/INTRALINK 3.X and Pro/INTRALINK 8.0 provide purge capabilities. However, in addition to purge, Pro/INTRALINK 8.0 and Windchill PDMLink 8.0 offer optional "Archive and Restore" capabilities integrated with purge in a common user interface. The archive and restore module allows customers to move data out of their PDM system onto lower-cost commercial mass storage devices while retaining the ability to restore the data at a later date. Detailed archive status information is provided as well as the ability to search archived indexes.

Differences Between Pro/INTRALINK 3.x and Pro/INTRALINK 8.0

Delivering these compelling new Pro/INTRALINK 8.0 capabilities required an architectural change. With this change in architecture, some changes in Pro/INTRALINK capabilities, concepts, terminology, and system administration have been introduced. To help customers understand these changes and make a smooth transition from Pro/INTRALINK 3.x to Pro/INTRALINK 8.0, PTC has created a "Getting Started with Pro/INTRALINK 8.0" guide, which will be available along with the release of Pro/INTRALINK 8.0.

3.2.1 Capability Differences

During the development of Pro/INTRALINK 8.0, tremendous effort was made to provide existing Pro/INTRALINK 3.x customers with comprehensive replacement capabilities. However, in a few specific areas it was not possible to provide exactly the same capabilities. Therefore, while Pro/INTRALINK 8.0 provides replacement capabilities for the most commonly used features, select functions available in Pro/INTRALINK 3.x are not yet available in Pro/INTRALINK 8.0. Most of these functions can be addressed in Pro/INTRALINK 8.0 using an alternative technique. Table 2 provides a list of the features and recommended alternative approaches. Enhancements to better address these capabilities are planned for future Pro/INTRALINK releases. For a more detailed comparison of Pro/INTRALINK 3.x and Pro/INTRALINK 8.0, refer to Appendix B.

System Administration Differences

In addition to capability differences, there are also installation and administration differences between Pro/INTRALINK 3.x and Pro/INTRALINK 8.0. Like other Windchill-based applications, Pro/INTRALINK 8.0 requires supporting applications to ensure full functionality and connectivity. These applications are provided with Pro/INTRALINK 8.0 or can be downloaded from the vendor at no additional cost and include:

- Apache Web Server
- Tomcat Servlet Engine
- Aphelion LDAP
- JDK/JRE (requires download from SUN)

Pro/INTRALINK 8.0 Capability	Pro/INTRALINK 8.0 Alternative Technique
Workspace frames	Pro/ENGINEER Wildfire 2.0 Undo/Redo
Workspace duplicate (with "update parent")	Server-side "save as"
Object export from workspace	Server-side export or Pro/ENGINEER file/backup
Non file-based attributes	File-based attributes (Instance Based Attributes)
Advanced baseline capabilities	Create baselines during check in, as stored configurations
Graphical relationship report	References, and referenced by reports
User-defined lifecycle attributes	May be addressed through customization
Folder-based attributes	Product/library attributes
Explicit "Hold" in Workspace	Download to workspace (without check-out) for implicit hold
Integrate	Manually merge changes
Shared lock	Access controls and checkout-on-the-fly capabilities
Briefcase	Clipboard
Branching	Revise to create multiple revisions

Table 2: Alternative approaches to capabilities in Pro/INTRALINK 3.x

With the change in architecture, the Pro/INTRALINK 8.0 hardware support requirements have been updated. Detailed hardware support information will be posted on the PTC Web-site prior to the release of Pro/INTRALINK 8.0. (http://www.ptc.com/partners/hardware/current/support.htm)

Like Pro/INTRALINK 3.4 and earlier, Pro/INTRALINK 8.0 is based upon the industry-standard Oracle® database.

Windchill PDMLink 8.0

Windchill PDMLink 8.0 is the latest release of PTC's pre-configured enterprise product data management (PDM) solution, which delivers a powerful set of workgroup and enterprise PDM capabilities blended with additional CAD system integrations, visualization services, and pre-defined engineering change and configuration management processes and workflows.

Windchill PDMLink 8.0 Capabilities Beyond Pro/INTRALINK 8.0

Built on the same Windchill 8.0 Web-based platform, Windchill PDMLink 8.0 is a superset of Pro/INTRALINK 8.0 including the same Pro/ENGINEER data management capabilities plus broader enterprise capabilities. These broader product development capabilities include the ability to define and manage a complete digital product model, process control and automation with Windchill workflow, change management, advanced configuration management, integral project collaboration and project execution, classification-based search and reuse, enterprise system integration, and expanded visualization capabilities. For more a more detailed comparison of Pro/INTRALINK 3.x, Pro/INTRALINK 8.0, and Windchill PDMLink 8.0 refer to Appendix B.

Complete Digital Product Definition

Pro/INTRALINK 8.0 has been optimized to manage the Pro/ENGINEER workgroup environment. Building on those capabilities, Windchill PDMLink also provides broader capabilities to create and manage a complete digital product model. To provide this complete product representation, Windchill PDMLink introduces the notion of an enterprise part, which represents a single physical part. Windchill PDMLink users can then associate a multitude of objects (e.g. MCAD models, ECAD models, software content, drawings, requirements documents, specifications) to this enterprise part. When working with Microsoft Office applications, Windchill PDMLink users can leverage PTC's Microsoft office integration to submit or retrieve Microsoft Office documents directly to and from the Windchill PDMLink vault without leaving the Microsoft Office environment. Similarly, Windchill PDMLink users also have access to extensive CAD tool integrations, which provide support for a multi-CAD environment.

Process Control and Workflow

The Windchill workflow solution provides a rich environment for graphically defining, executing, monitoring and managing business processes. Workflow capabilities are integral with the product data management environment. For example, when a part or document is created, a workflow can automatically be initiated to manage the part or document through its lifecycle states. The document development, review, approval and release can be controlled by one or more workflow processes that orchestrate the document or part through its lifecycle states. Workflow processes can also be initiated manually by users on demand.

Standard workflows are provided to manage object promotions, engineering change requests and change notices. Out of the box workflow process templates and customer process templates can be extensively tailored to include custom tasks, custom task forms, and simple or complex control logic. Variables can be defined to control process behavior and to allow interactions with product, part, document, and change attributes. Special activities can be defined, which are triggered based on system events (such as a part release) and which initiate applications.

Users can interact with processes through email delivered tasks and through personal work lists. Work can be reassigned to distribute workloads and delegated when a user is on vacation or traveling. Tasks can be associated with roles where participation is required or optional.

Change Management

Windchill PDMLink provides a flexible, powerful, and standards-based process that facilitates and controls product development changes in a traceable manner. This process spans the needs from an engineering

only change process all the way to an enterprise wide one. It includes a fast track for low cost changes and a full track for more in-depth business review and due diligence. Overall the process includes four fundamental steps of change management: submission of problems or enhancements, business approval of the change, planning the change and finally implementing and releasing the change.

This change process leverages change forms, roles within teams, and proven workflow capabilities that automate the process. The change forms (Problem Report, Change Request and Change Notice) contain the primary information about the change and link all of the information required to complete all the activities in the process. Roles and teams are used to automate the process by forwarding tasks at key work and decision points in the process. The workflow powers it all by controlling everything from who gets tasks to who can make the actual changes to the data.

This pre-packaged change process is based on industry best practices and PTC experience and can be easily tailored to meet the specific needs of individual customers.

Advanced Configuration Management

Windchill PDMLink provides rich capabilities for advanced configuration management. The Configuration management process in Windchill PDMLink uses the product structure as a focal point for the product definition. The product structure is more than just the bill of material (BOM); it includes the BOM but also contains the information that defines the product. This can include specifications, requirements, manuals, assembly instructions, CAD documents from multiple sources including MCAD and ECAD systems, and links to other information. Configuration Management in Windchill provides the following capabilities:

- Ability to model product structures and associate product definition data to parts in the structure tree
- Ability to manage the product/part structure in a number of configuration contexts
- Ability to expand and display a product structure according to filter criteria contained in the configuration context
- Ability to apply configuration context expansion of the tree by life cycle states, such as In-Work, Released; by structure views, such as As-Designed, As-Planned; by effectivity, such as serial number, lot number or date; and according to a specified structure baseline
- Ability to trace the relationships to all forms of product definition data, such as material specifications, CAD models, and manufacturing plans
- Ability to define alternates as well as substitutes to capture variability

Additional capabilities for structure modeling make it possible for Windchill PDMLink to record the exact configuration of individual end item instances, identified by a serial number, from the time they are built and delivered until they are retired from service.

4.1.5 Integral Project Collaboration and Project Execution

Windchill ProjectLink™ can be implemented with Windchill PDMLink to enable additional product development processes including the ability to easily and securely share information with external partners, suppliers, and customers, without providing access to the PDM system. This capability is useful, for example, when performing "what if?" design investigations, without requiring formal PDM control of information.

This combined Windchill PDMLink and Windchill ProjectLink deployment also provides the ability to extend project management and execution capabilities to the PDM system, facilitating processes such as New Product Introduction (Stage-Gate, PACE), Six Sigma, APQP, and Proposal Response.

4.1.6 Classification-based Search and Reuse

The Windchill Classification and Reuse module can be implemented with Windchill PDMLink to enable classification of parts as well as parametric attribute searching against classified parts. Parts can be classified or organized based on their part families and common attributes. Once the parts are classified, users are able to effectively and efficiently find existing parts to reuse in designs. With this optional module, users are able to search by browsing a graphical, hierarchically organized structure of parts or by using search criteria based on attributes that are critical to the design. With classification searching, search results are presented to the user in an easy to use hierarchical table.

4.1.7 Enterprise System Integration

Windchill ESI (Enterprise Systems Integration) simplifies the process of sharing critical information between design and manufacturing by providing a robust, pre-built interface between Windchill PDMLink and downstream ERP systems. Pre-built versions are available for SAP and Oracle Applications, and other ERP systems can also be supported through customization.

Windchill ESI enables the release of design information to manufacturing with a closed loop transaction management system to ensure data integrity. It supports publishing all major business objects, including new or changed parts, BOMs, ECNs, documents and their associated substructures like line numbers, reference designators, substitutes, and alternates. If you extend these objects with your own custom attributes or behaviors, the new attributes can also be supported with a documented configuration procedure. Status of releases can be viewed at a glance using the included user interfaces.

Windchill ESI also enables the query of manufacturing information like cost or inventory for use in the design process by providing a bi-directional integration framework. This framework is driven by an easy-to-use GUI interface, so setting up new queries is a painless process.

Expanded Visualization

Windchill PDMLink comes standard with embedded visualization capabilities based on ProductView Light. These standard capabilities include:

- Automatic viewable publishing for Pro/ENGINEER data
- Server-side storage of viewables generated on the client by the Workgroup Managers for Pro/ENGINEER, Unigraphics®, SolidWorks®, AutoCAD®, CATIA® V4, CADDS®5, and I-DEAS® (requires use of appropriate Workgroup Manager)

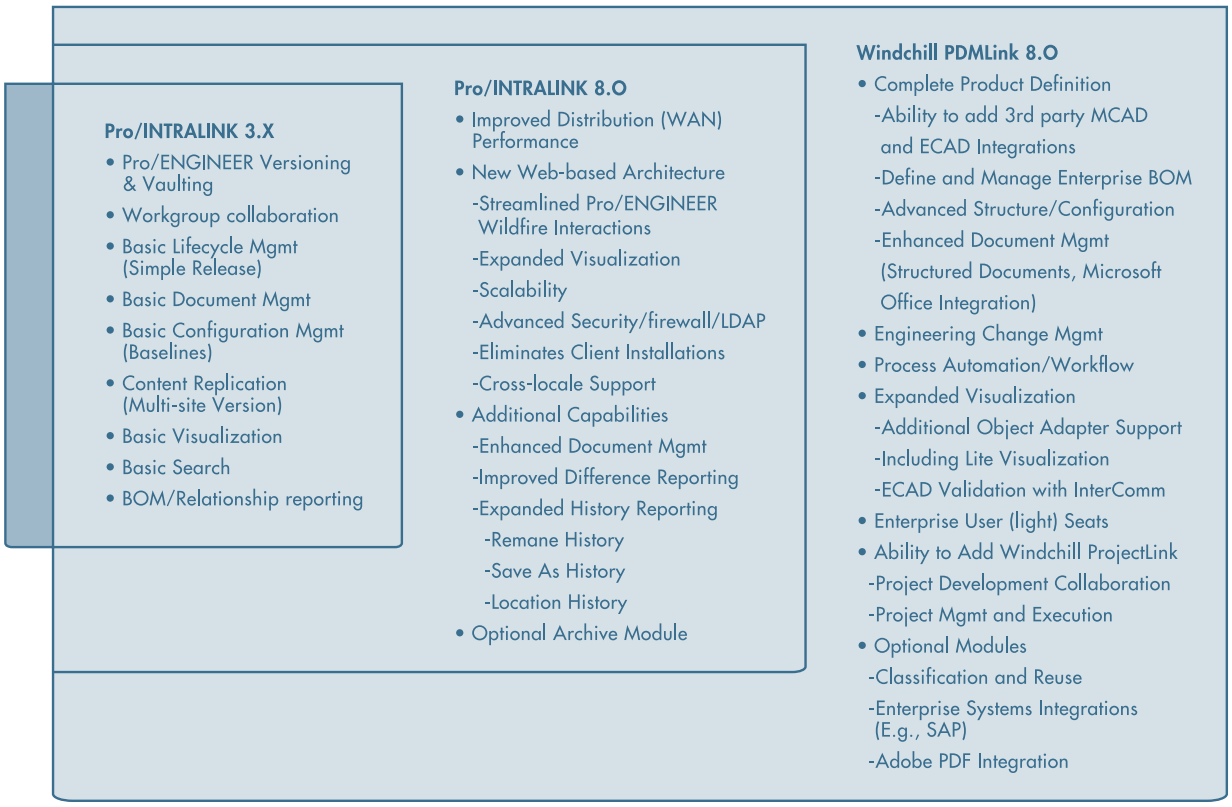


Figure 4: High-level comparison between Pro/INTRALINK 3.x, Pro/INTRALINK 8.0, and Windchill PDMLink 8.0

- 3D thumbnail viewing on details pages
- Lightweight Web-based visualization including annotation and measurement capabilities

In addition to these standard capabilities, the following optional capabilities are also available to Windchill PDMLink customers:

- Automatic viewable publishing for Microsoft Office formats including Excel, Word and PowerPoint to the PDF format
- Automatic viewable publishing for Unigraphics, SolidWorks, CATIA V4, CATIA V5, CADDS5, I-DEAS, and Microstation to the compact and accurate ProductView viewable formats
- Support for the JT viewing format
- Enterprise-wide visualization, verification, and annotation of electronic designs with InterComm

Finally, similar to Pro/INTRALINK 8.0, Windchill PDMLink customers can also add ProductView Standard Edition for access to:

- Rich viewing and markup of models, drawings, images
- Optional legacy documents and PDF viewing and markup
- Real-time collaboration between multiple ProductView users
- Advanced 3D model interrogation from accurate, yet compact, geometry
- Optional Realizer module provides interference checking, animation creation, and interactive mechanisms
- Optional Composer module provides interactive creation and editing of assembly sequences

What to do now?

As explained in sections 3 and 4 of this document, both Pro/INTRALINK 8.0 and Windchill PDMLink 8.0 offer existing Pro/INTRALINK 3.x customers' opportunities for expanded capabilities. These expanded capabilities are summarized in Figure 4 above.

Pro/INTRALINK 3.x customers have two options to obtain the improved capabilities provided by these solutions. These options include migrating to Pro/INTRALINK 8.0 or migrating directly to Windchill PDMLink 8.0. This section provides more information about the process of moving to either of these new solutions.

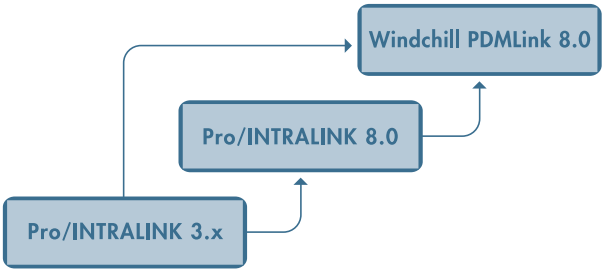
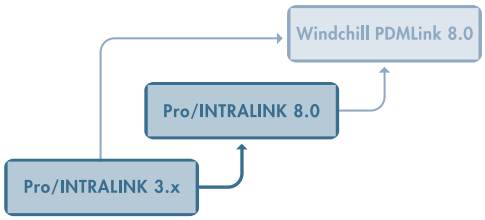


Figure 5: Illustration of migration options for Pro/INTRALINK 3.x customers

Migrate from Pro/INTRALINK 3.x to Pro/INTRALINK 8.0

Migrating from Pro/INTRALINK 3.x to Pro/INTRALINK 8.0 is a logical step for customers whose short-term focus is workgroup-level Pro/ENGINEER data management and deployment of new Pro/ENGINEER releases.



Moving to Pro/INTRALINK 8.0 provides existing Pro/INTRALINK 3.x customers with incremental benefits that span from usability and information accuracy to faster adoption and improved security. The three main benefit areas are improved usability, distributed system performance, and information access. The benefits from usability improvements are based upon an average 40% decrease in picks and clicks for everyday operations, enabling end users to perform operations more efficiently. The benefits from distributed (wide area network or WAN) performance improvements are based upon higher user productivity derived from the 5x improvement in distributed information transfer for normal PDM activities. Finally, information access and searching improvements provide additional productivity benefits for both CAD and non-CAD users.

PTC's Global Services offers a low cost, rapid deployment approach for implementing Pro/INTRALINK 8.0, that are designed toward ensuring widespread user adoption. The services offered include deployment services, training services, adoption services, and data migration services.

Deployment Services

PTC offers the Pro/INTRALINK 8.0 Pre-configured Install and Setup package. This package is offered to both existing and new customers of Pro/INTRALINK.

The Pro/INTRALINK 8.0 Pre-configured Install & Setup package includes:

- Installation and setup of server components including configuration with Pro/ENGINEER Wildfire desktop as an integrated server
- Business rules configuration
- Visualization configuration and initial publication
- Sample load of up to 30 CAD files
- Functional validation of system connectivity
- Knowledge transfer to users and administrators
- Mentoring the customer administrator
- e-Learning subscriptions for up to 10 users including Web-based training, on-line communities and other knowledge assets.

Training Services

In addition to the subscription training bundled in the deployment packages, stand-alone administrator and end-user training services are also available.

The Administrator training is offered in two formats: Instructor Led or Virtual Class and includes:

- System Administration: Architecture, Installation, Vaulting and Backup
- Business Administration: Lifecycle States and Transitions, Access Authorization, Container setup

Web-based end-user training is available for the following topics:

- Basic Data Management Concepts and Techniques
- Introduction to the Pro/ENGINEER Wildfire and Pro/INTRALINK 8.0 User interface
- ProductView client: Markups and Annotations

5.1.3 Adoption Services

Deploying Pro/INTRALINK 8.0 as a replacement for Pro/INTRALINK 3.x will change the working process of the Pro/ENGINEER user and administration process for Pro/INTRALINK administrators. Pro/ENGINEER users must be trained on a new Web-based user interface for accessing workgroup level Pro/ENGINEER data. System administrators need to be introduced to the tasks associated with administering a solution based on the Windchill Web-based architecture. To improve the acceptance of these changes PTC Global Services offers an Adoption Management package that helps customers successfully roll out Pro/INTRALINK 8.0 to their organization. The Adoption Services focus on:

- Organizational readiness to accept the changes
- Alignment of management to the user community
- Communication Planning
- Role based training plan development

5.1.4 Data Migration Services

PTC recognizes that there is a migration involved in moving from Pro/INTRALINK 3.x to Pro/INTRALINK 8.0. To support these migrations PTC provides software, training, and services to ensure a smooth transition.

The Pro/INTRALINK Data Migrator 8.0 is a tool that can be used to migrate data from Pro/INTRALINK 3.3 or 3.4 to either Pro/INTRALINK 8.0 or Windchill PDMLink 8.0. The tool migrates the following data from Pro/INTRALINK 3.3 or 3.4 databases:

- All versions of all Pro/INTRALINK objects (Pro/ENGINEER data and other document types)
- Pro/ENGINEER relationships and user-defined relationships
- Release levels and release schemes, (mapped to Life Cycles and Life Cycle States)
- Versioned, non-versioned, and dependency attributes
- Configurations (baselines and as-stored configurations)
- Completed RTP Forms, and check-in form information
- File vault content

The Pro/INTRALINK Data Migrator has the ability to migrate data into a new or pre-populated Pro/INTRALINK 8.0 system. Consequently, it has the ability to consolidate multiple Pro/INTRALINK 3.3 or 3.4 databases into one Pro/INTRALINK 8.0 system. The Pro/INTRALINK Data Migrator does not support migration from releases earlier than Pro/INTRALINK 3.3. Customers who would like to migrate from an earlier release should consult PTC Global Services.

A migration from Pro/INTRALINK 3.x to Pro/INTRALINK 8.0 may involve the transfer of large, complex data sets that have customer-critical and mission-critical importance. Consequently, PTC will provide comprehensive training, implementation, and support services to ensure migration success. These services will include:

Customer-Led Migrations:

PTC recognizes that certain customers will opt to perform their own migrations. As such we've prepared a number of tools to help in that process. Each of these is designed to eliminate common customer mistakes during migration. These include:

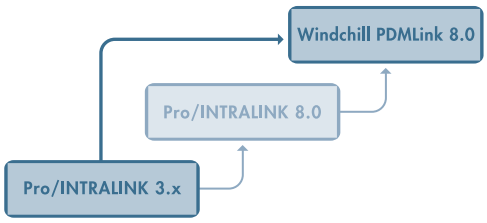
- Migration Questionnaire - PTC will provide a questionnaire that will allow you to gain a general understanding of the complexity of your migration. Based on the results customers will receive a recomended course of action. By taking this questionnaire, you will be able to set realistic expectations for the level of effort required for a successful migration. This questionnaire will be available on the Pro/INTRALINK Advisor site located on PTC's home page and will also be delivered in the Pro/INTRALINK Migration Training class.
- Pro/INTRALINK Data Migrator 8.0 - A tool used to migrate Pro/INTRALINK 3.x data to Pro/INTRALINK 8.0 or Windchill PDMLink 8.0. Pro/INTRALINK maintenance paying customers will automatically receive access to the Pro/INTRALINK Data Migrator 8.0 free of charge.
- Training - PTC highly recommends that customers take the optional 2 day Migration training class that teaches administrators the configuration, capabilities, and usage of the Pro/INTRALINK Data Migrator 8.0. In addition, there is an optional 3 day Administration training class covering the basics of administering the target system.
- Migration Advisor Package - An affordable services package that provides customers with a set of migration best practices and tools including templates for project plans, migration specifications, and validation tests. This includes 4 remote sessions with a PTC Global Services migration expert that can ensure you are on the right track, proactively identify issues that may delay your migration, and answer any migration questions you may have. Even if you have a simple to moderately complex migration, PTC strongly encourages you to take advantage of this service to ensure a swift and successful migration.

Migration Services Provided by PTC or a Certified Migration Partner:

For those customers seeking a low-risk alternative to in-house migration, or simply don't have the staffing required to perform a migration themselves, both PTC Global Services and PTC Certified Migration Partners are available to lead the migration project. The advantages of using experienced services personnel to lead the migration include:

- Minimize Risk – Provider-led service experts know Pro/INTRALINK and Windchill PDMLink better than anyone, and bring the experience of numerous successful migrations
- Resource Capacity – Often, customers have the knowledge to perform a migration, yet lack the internal resources to complete the project in a timely manner. Provider-led migrations minimize the need for customer resource time.
- Faster Migration – With certified experts managing the project, provider-led migrations also provide the quickest path to a successful migration.

Migrate from Pro/INTRALINK 3.x to Windchill PDMLink 8.0



Migrating from Pro/INTRALINK 3.x to Windchill PDMLink 8.0 is a logical step for customers who desire expanded Pro/ENGINEER data management capabilities and broader enterprise data management capabilities. This option involves migrating an existing Pro/INTRALINK 3.x deployment to Windchill PDMLink 8.0.

Moving to Windchill PDMLink 8.0 provides customers with additional benefits that span from improved usability, and faster adoption to

configuration reuse, reduced manual data reentry, and enhanced security. The three main benefit areas, however, are improved distributed system performance, change management, and BOM creation and management. The benefits from distributed (wide area network or WAN) performance improvements are similar to Pro/INTRALINK 8.0 with higher user productivity due to a 5x improvement in distributed information transfer during normal PDM activities. The benefits of change management are due to a reduction in the average cost of performing changes due to improved information control, process optimization, and supporting multiple processes by change severity. Finally, benefits of BOM creation and management result from reducing the number of staff dedicated to managing bills of material and increasing reuse of existing product configurations.

PTC Global Services offers a comprehensive approach for customers interested in implementing Windchill PDMLink. This includes deployment services, training services, adoption services, and data migration services.

Deployment Services

PTC offers two standard deployment packages: Pre-Configured Install and Setup and a Standard Deployment Profile.

- Pre-Configured Install and Setup: Delivers a blend of installation, configuration, and training services perfect for small production or pilot deployments.
- Standard implementation: Designed for larger implementations and includes all of the Install & Setup services plus adoption management, personalized configuration of the system and production server installation.

If desired, PTC offers assessment services to examine your current objectives and recommend a specific deployment strategy.

Training Services

In addition to the training bundled in the deployment packages, PTC offers a variety of Windchill PDMLink 8.0 training to ensure users have the knowledge they need:

- Training courses: Incorporate PTC's Precision Learning approach into a wide range of courses delivered in Live Classroom, Virtual Classroom, or Self-Paced formats
- e-Learning Subscription: Provide users with on-demand access to a library of Windchill PDMLink learning content including Web-based training, on-line communities and other knowledge assets.

Adoption Services

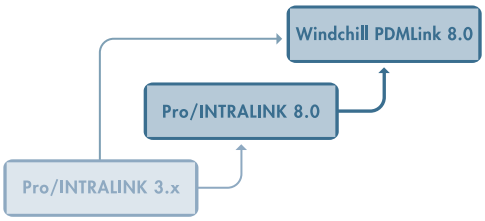
Similar to the deployment of Pro/INTRALINK 8.0, deploying Windchill PDMLink 8.0 will change the working process of users. To enhance this acceptance of these changes, PTC Global Services offers an Adoption Management package that helps customers successfully roll out Windchill PDMLink 8.0 to their organization. The Adoption Services focus on:

- Organizational readiness to accept the changes
- Alignment of management to the user community
- Communication Planning
- Role based training plan development

Data Migration Services

Migrating from Pro/INTRALINK 3.x to Windchill PDMLink 8.0 is similar to migrating to Pro/INTRALINK 8.0. The data migration process (including the ability to utilize the Data Migrator tool) and the high level tasks are the same for both migration paths. (See section 5.1.4 for more details)

The primary difference between a migration to Windchill PDMLink 8.0 and a migration to Pro/INTRALINK 8.0 is that a migration to Windchill PDMLink 8.0 may include the creation of enterprise parts and product structure. In Pro/INTRALINK 8.0, these concepts are not available.



Upgrading from Pro/INTRALINK 8.0 to Windchill PDMLink 8.0

If a customer's needs grow beyond Pro/ENGINEER data management, Pro/INTRALINK 8.0 can easily be upgraded to Windchill PDMLink at a future date. Pro/INTRALINK 8.0 and Windchill PDMLink 8.0 share the same database schema. Therefore, the move from Pro/INTRALINK 8.0 to Windchill PDMLink 8.0 does not require any data migration.

Whether it's 12 months, 18 months, or 3 years from the time you begin using Pro/INTRALINK 8.0, it is a relatively easy upgrade to Windchill PDMLink to accommodate those growing product development needs. PTC Global Services offers consulting services to help customers take advantage of the enterprise PDM capabilities of Windchill PDMLink.

However, please note, there is no advantage to moving first to Pro/INTRALINK 8.0 if Windchill PDMLink provides the full set of capabilities necessary to optimize the product development processes within your company. PTC encourages customers considering Windchill PDMLink to migrate from Pro/INTRALINK 3.x directly to Windchill PDMLink. When compared to a two-step process (migrating to Pro/INTRALINK 8.0 and then upgrading to Windchill PDMLink), migrating directly to Windchill PDMLink allows for a more efficient migration and implementation and is therefore more resource and cost effective.

Conclusion

PTC has a well-defined strategy and clear long-term commitment to provide a high quality, high performance, and fully capable Pro/ENGINEER workgroup data management solution based on the modern Windchill architecture. This architecture provides a solid technical foundation for product enhancements that will carry the

Appendix A: Is Windchill PDMLink the best option for you?

Windchill PDMLink should be considered as the more appropriate solution if you have the need for:

- Data management
- Managing mechanical CAD beyond just Pro/ENGINEER (such as SolidWorks, AutoCAD, CATIA, Unigraphics, etc.)
- Managing electrical CAD data from authoring tools such as Mentor and Cadence and associating them with the rest of the product structure
- Managing the complete product lifecycle from conception through retirement (i.e., beyond the workgroup)

Change management

- Supporting multiple change processes based upon the lifecycle and severity of a change request
- Maintaining different change review boards based upon product, lifecycle, and severity
- An out-of-the-box industry standard process to adapt for your company specific needs

Broader product development participation

- Enterprise pricing to support non-engineering users
- Ease-to-use Web-based embedded visualization to make understanding engineering information easier
- Supporting direct integrations to Microsoft Office so non-engineers can use their everyday tools to participate in design processes

Collaboration

- Turnkey creation of project collaboration spaces for cross-organizational or cross-enterprise collaboration outside of your data management system with optional Windchill ProjectLink
- Turnkey project management of long run projects to share and monitor progress against milestones, tasks, and other activities with optional Windchill ProjectLink

ERP integration

- Turnkey SAP and Oracle Manufacturing ERP integrations with optional Windchill ESI module

Classification and reuse

- Turnkey parametric searching and browsing using custom or standard classification schema to increase design and part reuse with optional Windchill PartsLink Classification and Reuse module
- Supplier management to associate parts to organizations with optional Windchill PartsLink Classification and Reuse module

Workflow

- Defining customized workflows to automate common processes and monitor them for process improvement

Expanded document management

- Direct integration with Microsoft Office applications for improved document management
- Support for structured documents

Appendix B:

Functional Comparison Between Pro/INTRALINK 3.x, Pro/INTRALINK 8.0 & Windchill PDMLink 8.0

Capabilities	Pro/INTRALINK 3.x	Pro/INTRALINK 8.0	Windchill PDMLink 8.0
Managing Documents (CAD and Non-CAD)			
Store and track versions of electronic documents (Including Pro/ENGINEER CAD files and non-CAD files)	•	•	•
Define templates for different document types	•	•	•
Define and manage user-defined attributes for electronic document objects	•	•	•
Rename objects in the database apart from the CAD tool	•	•	•
Define rules to control access to objects in the database	•	•	•
Track and report object history (Audit Trail)	•	•	•
Use object type to define native viewing application	•	•	•
Select multiple objects and modify the value of a common attribute	•	•	•
Create user-defined relationships between non-Pro/ENGINEER objects (structured documents)	•	•	•
Create user-defined relationships between Pro/ENGINEER objects and non-Pro/ENGINEER objects	•		•
Define different document types and assign a different lifecycle and set of attribute for each type		•	
Document history reports (rename history, save as history, location history)		•	•
Support multiple content files (e.g. primary, secondary…) for a single database object		•	•
Manage non-Pro/ENGINEER files as secondary content of Pro/ENGINEER object (includes control over whether or not content is carried forward to new versions and iterations)		•	•
Support broad product information access with a Web browser based user interface for enterprise users		•	•
Managing Products			
Ability to create a baseline, a configuration of objects, or bill of material, at a specific point in time for future reference	•	•	•
Ability to check out and download specific configurations and/or versions of a design (for example, latest or named baseline) for use in a CAD application	•	•	•
Ability to automatically track the "As-stored" (or as checked in) configuration of a set of CAD objects	•	•	•
Ability to configure part numbering and versioning schemes	•	•	•
Ability to annotate bills of material (product structures) and 2D or 3D views	•	•	•
Ability to completely define a digital product structure with associated documents created in various authoring tools (including CAD files, requirements documents, and specification documents)			•
Effectivity-based change control			•

Functional Comparison Between Pro/INTRALINK 3.x, Pro/INTRALINK 8.0 & Windchill PDMLink 8.0 (Cont.)

Capabilities	Pro/INTRALINK 3.x	Pro/INTRALINK 8.0	Windchill PDMLink 8.0
Ability to define and manage alternate bills of material			•
Ability to define and manage substitutes (alternate parts), part occurrences, serialized parts, and product instances (Note: this is not the same as Pro/ENGINEER interchange assemblies)			•
Ability to create and modify enterprise product structure which may or may not include heterogeneous CAD content			•
Ability to designate and track serialized parts			•
Searching for Information			
Flexible searching tools for locating objects based on attribute values and multiple sets of criteria	•	•	•
Store searches and queries for future use	•	•	•
Search for objects in the database without leaving the Pro/ENGINEER environment		•	•
Ability to search for text in documents (full text search)			•
Lifecycle and Change Management			
Define and track object life cycles (release levels)	•	•	•
End-user "set state" capabilities	•	•	•
Configure simple routing processes for releasing objects from one release level or life cycle state to another	•	•	•
Viewable access from promotion form for non-Pro/ENGINEER users		•	•
Task notification integrated with corporate email		•	•
Add-hoc approval/routing teams		•	•
Web-based review form for easy access		•	•
Pre-defined rules for "set state" and "revise" behavior		•	•
Multiple version schemes		•	•
Subscription and notification tools for automatic e-mail notification for object changes		•	•
RTP report	•	•	•
Ability to track and monitor engineering change process statistics			•
Out-of-the-box closed-loop change process management			•
Ability to define custom workflow-driven change process			•
Managing Workflows			•
Ability to document the configuration, policies, and procedures for the operation of the "system" in support of ISO 9000 or other business process initiatives	•	•	•
Ability to use a graphical interface to create a workflow consisting of tasks and roles			•

Functional Comparison Between Pro/INTRALINK 3.x, Pro/INTRALINK 8.0 & Windchill PDMLink 8.0 (Cont.)

Capabilities	Pro/INTRALINK 3.x	Pro/INTRALINK 8.0	Windchill PDMLink 8.0
Ability to create automated tasks and assign role-based tasks in a workflow. This includes the ability to sequentially lay out tasks, so one must be completed before another begins.			
Ability to have multiple branches or paths depending on conditions			•
Ability to notify an individual of a new task via e-mail or when user logs into the system, and the ability to send notifications on task events (for example, overdue or complete)			•
Tools for Collaborative Product Development			•
Ability to lock objects from being changed (e.g. workspace hold)	•	•	•
Replace contents of workspace and Pro/ENGINEER session with new designs from database	•	•	•
Ability to communicate a designer's intention to modify an object	•	•	•
Ability to easily and securely share data with suppliers across firewalls		•	•
Automatically warn user when changing objects that are not checked out, that is, locked		•	•
Design branching (ability to pursue design alternatives in a temporary environment and later merge changes back into main design branch)	•	•	•
Ability to perform peer-to-peer sharing of visualization sessions	•	•	•
Ability for users to participate in discussion forums		•	•
Ability to automate the process of integrating changes made by different users to a common Pro/ENGINEER model (parts or assemblies)	•		
Working with CAD Data			
Support for all Pro/ENGINEER object types and relationships	•	•	•
Relationship reporting capabilities (Model structure, BOM membership, family tables, where used, and Pro/ENGINEER relationship reports)	•	•	•
Manage Pro/ENGINEER family tables as separate objects	•	•	•
Managed local working environment (workspace)	•	•	•
Update command to keep users aware of latest changes made by others	•	•	•
Switch between workspaces	•	•	•
Support bi-directional transfer and change of CAD (file-based) attributes	•	•	•
Duplicate (save as) CAD product structures	•	•	•
Ability to configure the display of object and attribute information (saved displays)	•	•	•
Drag and drop	Limited	Extensive	Extensive
Multiple servers connected to one Pro/ENGINEER session		•	•
Single integrated user interface		•	•

Functional Comparison Between Pro/INTRALINK 3.x, Pro/INTRALINK 8.0 & Windchill PDMLink 8.0 (Cont.)

Capabilities	Pro/INTRALINK 3.x	Pro/INTRALINK 8.0	Windchill PDMLink 8.0
Ability to automatically number new CAD objects based on a company's part numbering system		•	•
Out-of-the-box integrations with leading 3rd Party CAD authoring tools			•
Ability to undo and redo changes made in a user's workspace	•	Limited	Limited
External simplified representation report	•		
Enterprise System Integration			
Ability to leverage a toolkit to create customizations that provides integrations with other legacy business systems	•	•	•
Standard (out-of-the-box) integrations with leading ERP vendors			•
Visualizing Data	•	•	•
Basic lightweight 3D object preview from Workspace and Commonspace for Pro/ENGINEER users	•	•	•
Basic lightweight 3D object preview from Workspace and Commonspace for Pro/INTRALINK users	•	•	•
Advanced visualization with markup and annotation capabilities	•	•	•
Client-side viewable generation		•	•
Support for Distributed Product Development (Performance, Scalability, Replication)			
Checkout and add to workspace "as links"	•	•	•
Scalable web-based 3-tier architecture		•	•
Performance sensitivity to network	High	Low	Low
Sharing of data between separate databases (e.g. "Package" replication)	•	•	•
Distributed content storage (vault/content replication) with local download	•	•	•
Replication rules	•	•	•
Replication file-size threshold		•	•
Replication fault tolerance		•	•
Replication compression		•	•
Distributed content storage (vault/content replication) with local upload		•	•
Automated content replication		•	•
Cross-locale support		•	•
Metadata compression for data transfer between client and server		•	•
Multi-threaded downloading and uploading, with uploading in background		•	•
Work offline		•	•

Functional Comparison Between Pro/INTRALINK 3.x, Pro/INTRALINK 8.0 & Windchill PDMLink 8.0 (Cont.)

Capabilities	Pro/INTRALINK 3.x	Pro/INTRALINK 8.0	Windchill PDMLink 8.0
System Security			
Domain-based access control (applied to objects in given domain using users, groups, roles)	•	•	•
Maturity-based access control (applied to objects based on release-level or lifecycle state)	•	•	•
Instance-based access control (overrides domain-based access control to grand additional permissions to individual objects)		•	•
Audit reporting capabilities (user activity, project activity, etc)		•	•
Client-server communication protocol	Sqlnet	HTTP, HTTPS	HTTP, HTTPS
Network zones (firewalls)		•	•
Authenticate users with standard web-based authentication		•	•
System Administration and User Interface			
Manage users and groups	•	•	•
Backup and recovery	•	•	•
Purging old versions and iterations	•	•	•
Ability for an administrator to set default user behavior	•	•	•
Open APIs for Customization (for example, triggers)	•	•	•
External LDAP server		•	•
Ability to customize application user interface		•	•
Archive & restore		•	•
Ability to provide a user-specific home page where users can view current work, tasks, and assignments		•	•