MERIDIAN SYSTEMS

PROLIANCE

The Business Benefits of the Proliance® Architecture

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Executive Overview

Increasingly, large business enterprises that rely on physical infrastructure to deliver their core business are recognizing the need for a solution that effectively improves top line revenue growth while reducing capital construction costs. In selecting such an Infrastructure Lifecycle Management (ILM) enterprise solution, these organizations must consider the technology platform of that solution.

The Internet became an important medium for conducting business in the late 1990s and early years of the new millennium. The Internet, combined with corporate business objectives, has forced a foundational change as to how enterprise applications are designed and built. This new foundation for enterprise Internet applications is called a Service Oriented Architecture (SOA).

Through solutions built on an SOA, enterprises can realize strategic advantages for the operability and system management of their IT departments. An SOA recognizes that technology solutions designed as a number of autonomous "services" support the integration and growth demands of today's business enterprises. An SOA lets various technology environments and applications exist while leveraging legacy applications and infrastructure.

Proliance delivers enterprise Infrastructure Lifecycle Management (ILM) business solutions on a native SOA technology platform. This translates to providing open solutions for real-world business problems, lowered support costs, improved collaboration, expandable system capabilities, and reduced costs for integration with third-party systems.

The SOA foundation of Proliance meets the rigorous demands of today's enterprise IT departments. It is also a foundation that solves real business problems, aligning transactional and analytical business applications for operational users with the right long-term IT platform for the next 7 to 10 years.

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Understanding the Proliance Architecture

The Proliance Architecture incorporates the concepts of a Service Oriented Architecture (SOA)—an approach to solution development that entrenches the concept of integration deep within the design of the solution. SOA has come about as IT solutions have traditionally suffered from two major issues:

1. Inflexibility after customer deployment

2. High ongoing cost of ownership in integrating with other systems (passing information to and from the system)

An SOA-based solution aims to alleviate these issues by recognizing that the system should be designed as a number of autonomous "services." These services can link with other third-party systems and expand over time to provide an infrastructure in which to solve key business problems.

The rapid industry adoption of such technologies as XML and Web Services has provided the building blocks for realizing an SOA solution. Proliance uses secure and industry standard Web Services and has utilized XML as the core data representation format. This translates to providing open solutions to the real-world business problems of expanding system capabilities and to reducing the costs of integration.

Proliance is built in a number of design layers, often referred to as an N-tier architecture. Design layers allow for scalability options so that logical tiers can be mapped out onto separate physical computer servers. For example, Proliance serves user interfaces via a web server infrastructure, while storage can be on your existing Relational Database Management System (RDBMS) back office servers. This N-Tier design allows the Proliance solution to grow in both a measured and economical way to serve thousands of concurrent users.

Proliance is built on an N-tier architecture that allows measured and economical growth.
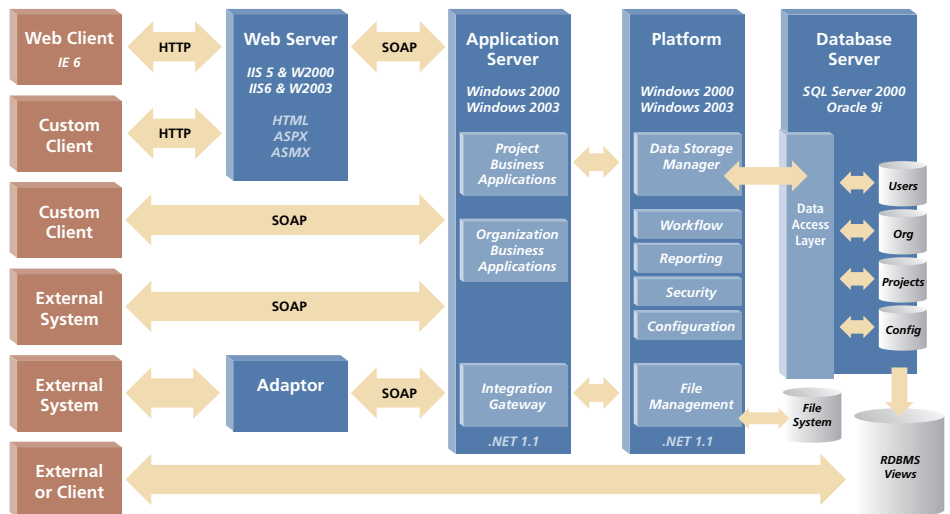
The logical tiers of the Proliance Architecture are:

User Interface
The user interface is a zero-footprint, browser-based client designed around the concepts of thin-client computing. Any authorized user in any location can access Proliance information using a standard Internet browser and an Internet connection. The browser deployment reduces IT administration costs and provides good reach for different customer types whose staff and clients are geographically dispersed.

Services Interface
Incorporating SOA, Proliance provides a comprehensive set of Web Services comprised by the fine and granular business services. These business services are accessed by the user interface and are based upon open industry standards for ease of integration. The service interface is "two-way" in that it can service a request for information as well as push information out of Proliance, i.e. receive and call Web Service requests.

Business Applications
Business services for distinct project processes are organized into specific series or bundles that constitute each Proliance business application. This modular building-block approach allows for expansion of more applications over time with the additional benefit of leveraging the capabilities of the underlying Proliance Platform.

Proliance Platform
The Proliance Platform is the core set of technologies that makes up the common features of the Proliance business applications. Workflow, security, collaboration and management make up the most significant parts of the underlying Platform.

Storage
Proliance data storage is based upon a third-party RDBMS of either Oracle® 9i or Microsoft® SQL Server 2000. Proliance File and Drawing Management features also allow for storage of binary files onto a standard new technology file system (NTFS).

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SOA is the next phase of innovative application development. SOA is a radical departure from client-server and first-generation website applications, exposing a much richer set of Application Programming Interfaces (API) and allowing greater extensibility and flexibility in enterprise technology infrastructure.

How and Why is Proliance Architecture Different from Previous Product Architectures?

The Proliance Architecture represents a clean, strategic start in terms of product design for large-scale business applications. The use of an SOA with Web Services and XML represents a fresh design, moving away from the traditional desktop client-server model or the Internet shared website legacy products.
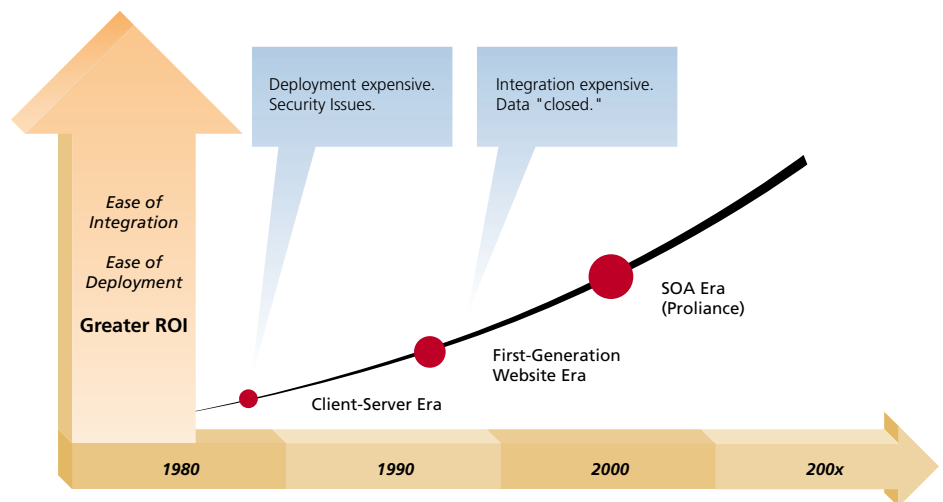
The Proliance Architecture treats open and standard integration as a first-class citizen, while providing flexible deployment options for the customer and breaking the restrictions of previous products.

One radical departure from legacy website and client-server based designs is the way in which the Proliance Architecture exposes a much richer set of Application Programming Interfaces (API). The use of Web Services has created a different dimension in terms of exposure of the business logic within the solution. As each business service was designed to be composed into a chain of workflow within the existing application, the extensibility offered by the API far outstrips what is offered in traditional applications where extensibility is often added as an afterthought.

The use of XML as the foundation of the data stored within Proliance has opened opportunities in terms of open and standard data exchange. Previous product architectures have relied upon either binary or a closed relational model forcing the customer into using a proprietary access API. Proliance data using XML and XML schema allows a standard way to describe the structure of the information as well as providing additional data about the data (or metadata). This "metadata" connects to the solution data and allows for the context of how the solution data may be used to travel outside the solution. Therefore, metadata opens integration possibilities that a legacy client-server or first-generation website design could never offer.

Proliance Architecture Lowers Total Cost of Ownership

Estimating an accurate total cost of ownership (TCO) for a solution is becoming increasingly relevant to successful IT operations. The last 3 years have shown that IT initiatives with the most immediate return of investment involve reducing running costs. The Proliance Architecture provides a number of advantages in terms of the cost of IT ownership:

Hardware
IT departments can deploy Proliance on cost-effective commodity computer hardware. As a part of its design, Proliance works within a web farm commonly deployed in data centers, while taking advantage of the back office RDBMS storage technology. This mix of "scaling out" in terms of web servers and "scaling up" in terms of database storage is a proven pattern for the most economical use of today's hardware. This translates to serving more users with less hardware and better response times.

Infrastructure
Proliance deploys over the Windows® Server 2003 that is proven to reduce administration costs significantly compared to previous releases and other OS vendors. The Proliance Architecture uses enterprise management features such as event logging and notification, real-time performance counters and existing security management infrastructure.

Zero-Footprint Client
As Proliance is browser-based, the number of clients does not become a deployment issue for IT operations, eliminating any impact on users' desktops or installed software.

Business Process Expediency
The Proliance Architecture has been built to flexibly execute Business Process Management. Through a series of configuration policies, the Proliance Architecture allows clients to update quickly the constantly evolving business processes used within the Proliance business applications. This translates to a real business benefit, allowing companies to capitalize rapidly on business changes without lengthy and expensive software changes. The event driven-nature of the design allows the system to respond to real-life business changes more quickly.

Lower Integration Costs
Meridian built the Proliance Architecture using the recent advances in open Web Service industry standards and XML. This allows clients to leverage existing IT staff skill-sets on current applications, whether those applications are VB, Java or C++ based, and allows Proliance to fit excellently with any existing enterprise application infrastructure investments.

Uniform User Interface
As part of the Proliance Platform, the browser-based user interface employs a number of simple, yet powerful workflow concepts for Business Process Management. This uniformity reduces the costs in end-user training and lessens the reliance on tier-one help desk support.

Additional Application Server Licenses
The Proliance Architecture does not use third-party application server licenses such as Citrix® Metaframe or expensive J2EE container software. The Proliance solution lacks these high initial costs and the ongoing support of additional infrastructure.

Proliance Architecture Facilitates Collaboration

Effective collaboration within your teams is one of the primary motivations for an information system such as Proliance. The Proliance Architecture has a number of innovative features in its Workflow Engine and Platform to both facilitate and govern this collaboration:

XDoc
The XML Document (or XDoc for short) is a user interface metaphor based on the way users manage paper documents. The XDoc is the "record" that is sent around by the users who perform various tasks on the record as it travels through the process. This metaphor allows users to plan and monitor business process management while retaining the collaborative freedom of a task or email-like system.

Notices
Notices use an "electronic Post-It® note" metaphor leveraged to help the user move the XDoc to the next stage in the business process for that specific XDoc. This very natural way of workflow and process indication provides users with a very powerful method to monitor and track their required tasks.

User Interface Integration
The Proliance Architecture allows for XDocs to be recalled as links in a similar way to web page "Favorites" or "Bookmarks." This linking coupled with notification of tasks through existing email systems provides team collaboration using the tools that are already familiar to users.

Workflow

The Proliance Architecture combines the power of free-form collaboration, using XDoc Notices with configurable constraints and business rules that are required to track a formal process. Each XDoc has a number of planned "states" that the XDoc can be preconfigured to process through. For example, a contract over a certain limit must be signed by an authorized manager before it can move to the "approved" state.

System of Record

The Proliance Platform records all collaboration as part of the ongoing Activity Log for the XDoc. This allows you to see who received, worked on and completed business processes.

Uses Tools Users Already Know: Email

The Proliance Platform leverages standard email messages to pass actions and Notices to users. The Workflow Engine pushes out information viewable in any standard email application such as Lotus Notes or Outlook®. The email includes a URL link to the relevant XDoc with a description of the required workflow step, resulting in simple navigation to the right information by the right people – without expensive training.

Uses Tools Users Already Know: Microsoft Office 2003

The Proliance Platform and its use of Web Services and XML allow Office 2003 to complement the browser-based user interface. This allows the powerful combination of working with the tools users already know, but without the deployment and security issues of desktop or ActiveX installations – all with standard and secure Web Services.
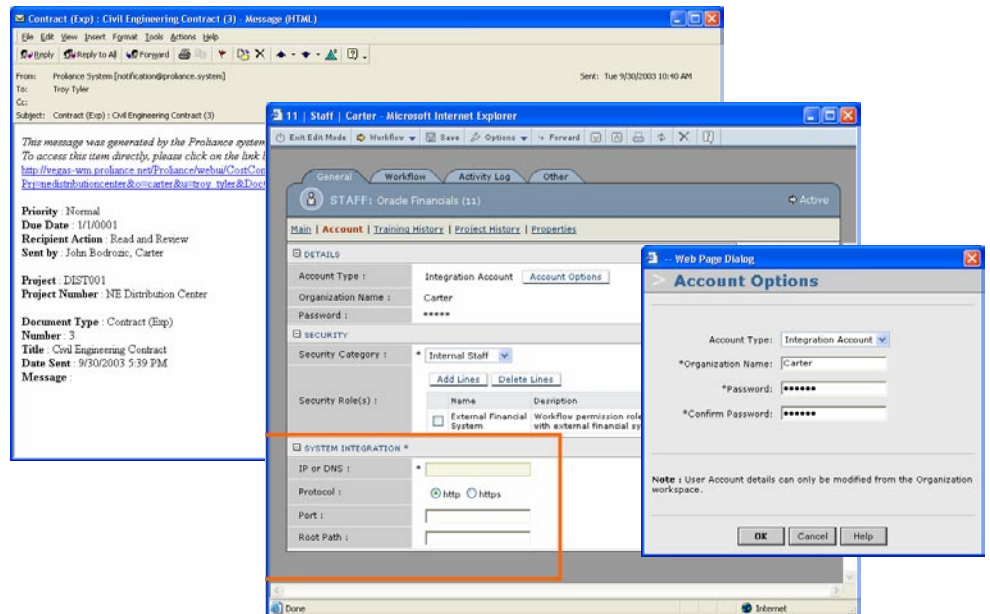
Proliance Architecture Facilitates Integration

Meridian designed the Proliance Architecture for integration. The features within the Proliance Platform that integrate with your existing systems include:

XDocs
The Proliance Platform treats XDocs as "messages" to other third-party systems. Through Web Services and XML, this message-based approach to integration architecture builds upon open industry agreed standards and is proven to succeed in large-scale integration scenarios.

Workflow
Due to the nature of the XDoc Business Process Management system within the Proliance Platform, third-party integration can be real-time and immediate. Just as a user may send a task to a co-worker through a Notice, Proliance can notify an external system of some required action and call an outside Web Service. This real-time event notification is only possible within a solution architecture, like that of Proliance, built upon business processing and events. The Workflow Engine on the Proliance Platform is an example of an event-driven architecture.

Web Service Interfaces
The Proliance Platform Web Services are based on the Web Services Interoperability Organization (WS-I) Basic Profile 1.0 which represents a wide industry consortium on how to offer open Web Services. As a result, Proliance can communicate with many other applications from many vendors, whatever their platform or technology bases.

Enterprise Application Integration (EAI) products
The Proliance Architecture is an excellent fit with any existing EAI infrastructure. Through Web Services and self-describing XML, the Proliance business applications take the place of a "chain of applications" that make up the existing business solution. An additional benefit of standards-based Web Services is that EAI is achievable without having to purchase expensive additional "adapters" – often a hidden cost in an EAI deployment.

Through Web Services and XML technology, Proliance integrates with enterprise financial and document management solutions. Here, Proliance integrates with Microsoft BizTalk Server to complete project and portfolio processes within Proliance and third-party systems.
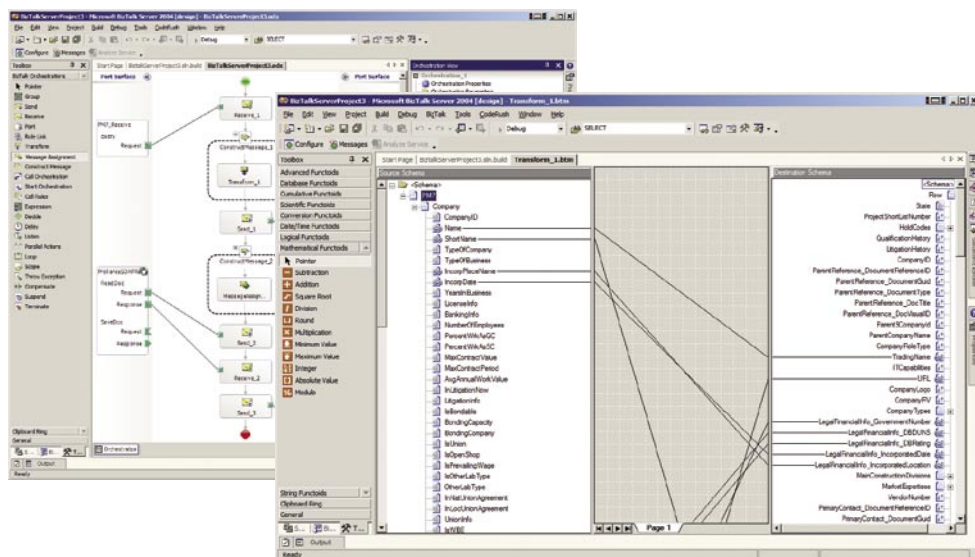
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What is the Value of the Proliance Platform?

The Proliance Platform is the concept in which the business applications run upon a library of common functionality. The Platform acts as the "engine" of the Proliance business applications. This Platform provides a number of business advantages to the Proliance Architecture:

Uniformity
As part of a system's total cost of ownership (TCO), training and support make up a significant running cost. The Proliance Workflow Engine as part of the XDoc's Business Process Management helps provide a consistent set of functionality for the end user. All of the Proliance business applications are based on the single platform and essentially work in the same predictable and managed way, requiring significantly less training than several separate solutions.

Ongoing Improvements and Expansion
As the Proliance Platform grows, newly developed and existing business applications will benefit from upgrades to the underlying infrastructure. Functionality additions in terms of configuration, security and workflow are all immediately available to the Proliance business applications.

Security
The Proliance Platform presents a single path to data through a security control layer. This ensures that a single entry point that records all activity governs both the user interface and Web Services.

IT Investment Protections
As OS and third-party communication and collaboration technologies evolve over the next 10 years, upgrades to the Proliance Platform help protect your investment in the Proliance business applications. This allows the Proliance Architecture to evolve in a controlled manner that still takes advantage of the rapid growth in these underlying technologies.

Governance and System of Record
Business Process Management within the Proliance Platform allows the uniform configuration of the Workflow Engine and ensures that work processes and internal best practices of the organization are followed. The Activity Log feature records all transactions that occur concerning the business data and provides an audit log of both the process and the data changes.

Proliance Platform Facilitates Quick Release Cycles

The Proliance business applications are "modular" in that they are self-contained units of business functionality. This modularity offers the Proliance Architecture a number of advantages:
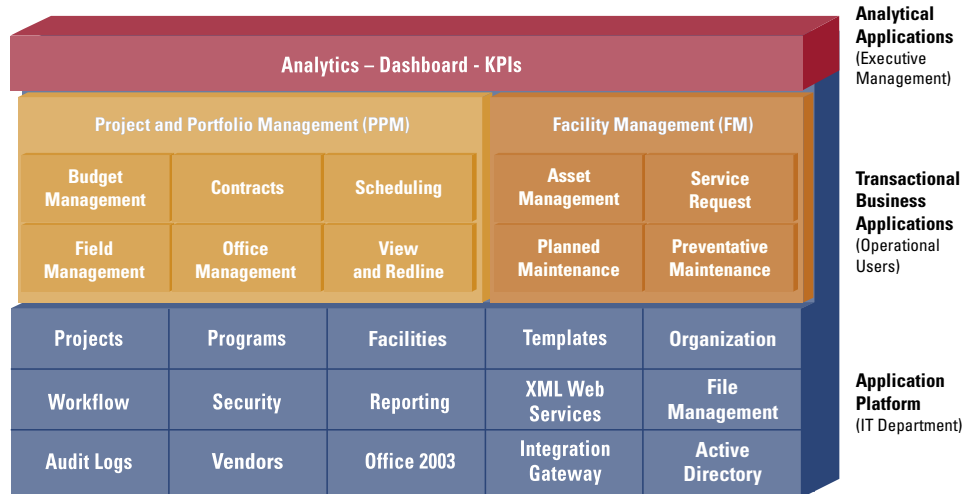
Business Applications Choice
The underlying Proliance Platform allows Meridian to develop business applications much more rapidly than an architecture that does not support an underlying common feature platform. This increase in development productivity is passed on to the end customer as more choice in available business applications as well as their decreased time to market and an ongoing assurance that Meridian will provide a powerful business solution.

Business Application Licensing
This modular approach to adding new business applications to the Proliance Architecture creates a flexible software-licensing plan that meets immediate business needs.

Business Applications Software Development Kit
In a future initiative, clients may use the Proliance Platform to create specific applications. This is a development-based toolkit that will allow clients to take advantage of the features of the Proliance Platform for specialized internal solutions.

Analytics – Dashboard - KPIs					**Analytical Applications** (Executive Management)
Project and Portfolio Management (PPM)			**Facility Management (FM)**		
Budget Management	Contracts	Scheduling	Asset Management	Service Request	**Transactional Business Applications** (Operational Users)
Field Management	Office Management	View and Redline	Planned Maintenance	Preventative Maintenance	
Projects	Programs	Facilities	Templates	Organization	
Workflow	Security	Reporting	XML Web Services	File Management	**Application Platform** (IT Department)
Audit Logs	Vendors	Office 2003	Integration Gateway	Active Directory	

Proliance Platform Facilitates Security Procedures

The Proliance Architecture utilizes the IT industry's best practices in terms of security procedures. Areas of the Proliance Architecture that reinforce this strong security include:

Data Security
Users access all XDoc business data through the security features of the Proliance Platform. The system checks the credentials of the user to ensure that each user is properly authenticated and has authorization to access the data requested. Proliance keeps an Activity Log with each XDoc to record this interaction.

Process Security
All actions performed on an XDoc require underlying Proliance Platform permissions. These permissions are allocated to roles that reflect the typical activity of the user. The user may have a number of roles, and the permissions given to each role are fully configurable.

Accounts Security
Proliance can use either its internal user account management system or rely upon outside authentication through a Microsoft Active Directory® of NTLM Windows Account management. The infrastructure also allows for a third-party system such as Netegrity®, RSA Security® or Microsoft ISA to provide gateway authentication. The Proliance Platform user account management follows industry best practices of SHA1, part of the NIST's Digital Signature Standard.

Storage Security
The Data Protection API securely holds all underlying RDBMS connection information. This API uses strong Triple-DES algorithm in CBC mode, the strong SHA-1 algorithm, and the PBKDF2 password-based key.

Infrastructure Security
The Proliance user interface can run over high encryption 128-bit SSL secure web connections to guarantee data integrity between the client and web server. The Proliance Architecture uses standard ports and works in compliance with standard data center security policies to operate within a DMZ.

Web Service Security
The use of the standard WS-Security 1.0 protocol protects Proliance Web Services.
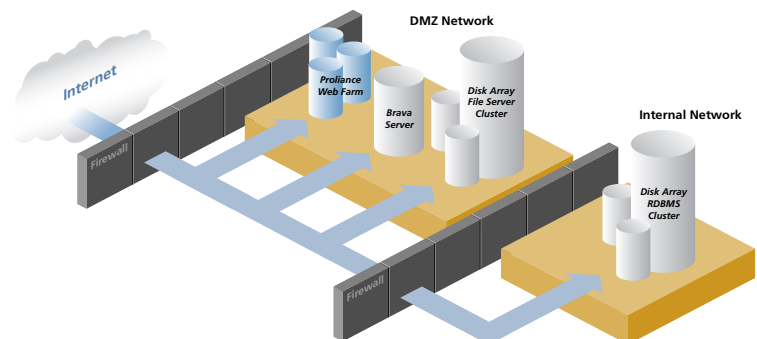
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Why is Proliance Architecture the Right Long-Term Technology Investment?

Any significant investment in an enterprise solution should be made in applications that are built on an SOA, the IT community's agreed upon application architecture of choice for the next 5 to 10 years. Making an investment in an SOA-based application will provide the longest return on that investment, as opposed to making investments in non-SOA applications such as legacy first- and second-generation client-server and website applications.

The usage of an SOA design within the Proliance Architecture represents a significant and innovative solution development investment on the part of Meridian and embodies the best long-term investment for Infrastructure Lifecycle Management (ILM) business applications. The IT community universally recognizes SOA as the path forward; companies from all across the spectrum agree:

IBM on SOA

"The way business has been changing over the last few years and the expectations of the Internet really mean that these notions of service-oriented architectures and being able to work across heterogeneous environments … there's no question that we have to do it. The logical questions are around when and how as opposed to if."
(Dr. Bob Sutor, IBM Director of WebSphere Infrastructure Software)

Microsoft on SOA

"The goal for a Service Oriented Architecture (SOA) is a worldwide mesh of collaborating services, which are published and available for invocation on the Service Bus. Adopting an SOA is essential to delivering the business agility and IT flexibility promised by Web Services."
(http://msdn.microsoft.com/architecture/soa/default.aspx)

HP on SOA

"SOAs add value by breaking up silos of information, making it easier to reuse shared services, improve interoperability between systems and automate business processes."
(Shane Robison, HP Chief Strategy and Technology Officer)

Gartner on SOA

"Implementing a Service Oriented Architecture and Business Process Management are crucial steps towards becoming a real-time enterprise, creating the foundation to respond faster to changing business requirements and to react to events in realtime."
(http://www.tekrati.com/T2/Analyst_Research/ResearchAnnouncementsDetails.asp?Newsid= 2960)

Proliance Architecture Offers IT Solutions

The Proliance Architecture provides solutions to the IT needs within large business organizations. In this recent survey of CIO top five priorities, many of the Proliance Architecture advantages are evident:

Top IT Management Priorities for CIOs:

1. Providing IT guidance to senior corporate executives
2. Demonstrating the business value of IT
3. Improving the internal governance of IT operations
4. Taking steps to reduce total IT costs
5. Developing or enhancing corporate IT architectures

(620 CIOs and other IT executives worldwide, surveyed in the fourth quarter – Gartner Inc., Stamford, Conn.)

The Proliance Architecture offers these solutions to the above list:

1. An infrastructure for IT guidance as provided by the Proliance Platform
2. Multiple focused and feature-rich business applications in industry-specific ILM areas that show real business value
3. Governance, System of Record using innovative Business Process Management workflow on the Proliance Platform
4. Total Cost of Ownership (TCO) reduction features that show concrete cost reductions
5. A way forward in incorporating an overall IT architecture

Differentiating Native SOA Architecture from Pretenders

Many software companies made significant R&D investments in web-based solutions in the late 1990s when the Internet was emerging. Most of these companies selected first-generation Internet technologies as their solution foundations. History teaches us that there are a number of "false starts" when a new market evolves, as has occurred in the evolution of Internet applications. Many of these software companies built their solutions on these "false starts." Because of these fads, many software companies are creating intermediate SOA layers on top of their old client-server or first-generation foundations.

Proliance is a native SOA technology platform, and it does not use any legacy technical foundations. There are a number of ways to "look under the hood" to truly determine whether a software vendor has a native SOA foundation in place. The following are items that Proliance complies with and that should be used to benchmark other vendors:

1. All application data must be available via Web Services, with no exceptions.
2. Every document must have a defined XML schema.
3. The Web Services in the application must be built against well-known, open standards such as XML schema 1.0 and SOAP 1.1.
4. The Web Services must be secure by using the industry standard of WS-Security 1.0 Specification.
5. The Web Services must be described using a Web Service Description Language (WSDL) data "contract" that allows for stable integration.
6. The Web Services must work over any associated firewalls, proxies and standard Web Service protocols.
7. The application must have an Integration Software Development Kit with fully documented examples that demonstrate the use of the application's Web Services.

Every document in Proliance has a well-defined XML schema that details the structure of the data and supports Enterprise Application Integration.
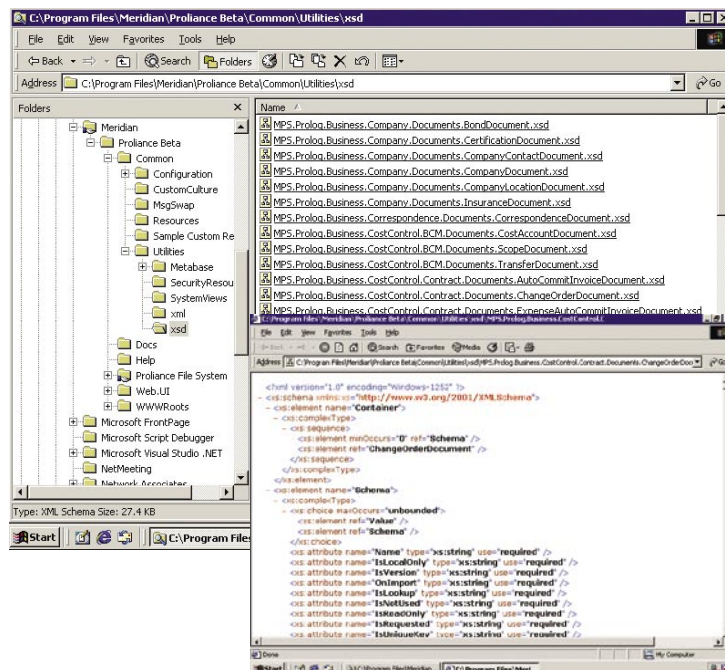
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Summary

Proliance delivers companies that manage the physical infrastruture lifecycle an enterprise solution on a modern, stable and long lasting technical foundation of a Service Oriented Architecture (SOA). Built on an SOA, Proliance goes beyond the legacy client-server or website design applications that appear to leverage the power of the Internet for solution design. These pretender web-based solutions use the Internet to create a web-accessible user interface, but do not use Web Services within their architectures; and therefore, do not leverage the benefits of open solutions with expanding system capabilities that reduce the costs of integration.

Leveraging Web Services, Proliance provides improved:
- **Integration** - Web Services and XML allow for real-time integration with other enterprise systems.
- **Collaboration** - an SOA facilitates easier access to supply chain for collaboration of real-time information.
- **Scalability** - Mission critical application designed to handle thousands of users in a server farm.

Unlike older, incomplete solutions, The Proliance Architecture leverages Web Services technology within the architecture of the solution and the user interface, offering solution deployment flexibility and lowering total cost of ownership (TCO) to integrate and maintain enterprise application infrastructure.

Utimately, the Proliance Architecture delivers immediate and long-term business benefits for organizations involved in the infrastructure lifecycle of planning, building and operating capital facilities. It is the right technology foundation that solves today's real business problems of integration and collaboration, while also being the right long-term technology foundation that will grow and scale as your organization expands and changes into the future.