



AberdeenGroup

Services on Demand
Give Companies
Control over
Information Chaos

An Executive White Paper

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Aberdeen Group, Inc.
*One Boston Place
Boston, Massachusetts 02108 USA
Telephone: 617 723 7890
Fax: 617 723 7897
www.aberdeen.com*



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Preface

“Information chaos” describes the state of having too much information dispersed in too many places to be useful. Harried workers spend large portions of their time managing login names and passwords, and juggling disjointed e-mails, mobile device alerts, and the outputs of mission-critical applications. Demanding access to accurate, relevant information anytime, anywhere, and from any access device, users are increasingly frustrated by the limitations of incompatible applications and interfaces. The empowerment they seek lies in intelligent, coordinated application services that make their lives easier, not more complicated.

Theoretically, enterprise business systems and supporting infrastructures should calm the tempest of information overload. The ideal computing environment should add context and structure to unstructured content, integrate all distributed applications as well as newly emerging Web services, and head off any impending network overload issues before they create bottlenecks and gridlock.

The solution begins with Web portals — a powerful approach to ordering information. As the standardized user interface to Web-based applications and services, Web portals provide users with flexible, reliable access to legacy, Web-based, and custom business processes. Already proven, the portal approach provides an infrastructure that separates the back-end development and processing challenges from the front-end presentation and delivery issues. It allows business processes and information to be offered to users “on demand” from anywhere, at any time, and through any connected device. Full exploitation of this potential, however, requires masterful execution and integration of critical supporting technologies that are less obvious than the user-facing portal itself.

This Aberdeen *Executive White Paper* discusses the business challenges — and opportunities — presented by the business information explosion. This paper discusses the benefits of implementing a portal-based strategy; moreover, it urges enterprises embarking on this strategy to attain ironclad control over infrastructure elements such as directories, application servers, and business processes. Aberdeen considers the role of Web services in establishing a lasting digital trust with partners, customers, and suppliers. Profiling Sun Microsystems’ vision for providing what it calls “Services on Demand,” Aberdeen details the Sun Open Network Environment (Sun ONE) platform. The paper concludes with our recommendations for the evaluation and deployment of a platform for dependable, effective Web services.

Responding to the Causes of Information Chaos

How can workers be effective if they cannot find the information needed to make a decision? How can a supply chain be optimized without pricing, availability, and

logistics data that is critical to determining inventory and production requirements?

The intersection of three trends is at the root of today's information chaos:

1. *Increased availability of unstructured data:* The sheer volume of Internet-induced information — including data previously locked in legacy applications — undercuts its usefulness.
2. *Rapid proliferation of access points and devices:* Enterprises seeking to expand the net of revenue generation and productivity are faced with a growing list of access devices and an infinite list of locations. For example, employees freed from their desks work from varying locations on a range of devices, or customers order products at 3 PM and 3 AM, and anytime in between, from the location that is easiest for the buying process — be it at a home PC, in a car, or on the showroom floor.
3. *Rising demand for cross-function/cross-application business processes:* As enterprises leverage the Internet to connect far-flung individuals, applications, and business processes, they generate an increase in information volume and variety.

Each element brings with it a flood of details and demands — all information that must be recorded, saved, interpreted, and employed to increase the level of services being offered. To prepare for the resultant increase in information and stave off information chaos, companies should establish an infrastructure that:

- Leverages existing information assets, thus expanding their value while preparing to capitalize on newly available innovations;
- Provides visibility into the information assets of the extended enterprise;
- Heightens an organization's ability to perceive and respond to new opportunities and challenges;
- Improves efficiency by enabling reuse of assets;
- Responds to the unpredictable, dynamic Internet environment; and
- Manages the tracking of work progress and process improvement through meaningful measurements.

A foundation of Web services provides just such an infrastructure — one that affords flexibility of access and awareness of use. Web services are collections of functions that are published to the network for other services to identify, access, customize, and use.

When Web Services become available “on demand,” the process adjusts to the user's need, rather than requiring users to adjust awkwardly to staid, unresponsive, one-size-fits-all applications. In this agile services environment, application

components are dynamically discoverable, callable, and therefore reconfigurable in real time — to produce precise responses to user requests.

Web Portals: A Good Place to Start

Portals — already market-proven and accepted — are the obvious first stop on the road to information accessibility. At a minimum, their ability to aggregate information from disparate sources provides a unifying basis on which to improve the organization and presentation of diverse types of information. At their best, portals offer enterprises the ability to present information that is personalized — customized for specific communities and audiences in real time — right down to the individual.

This level of agility is both achievable and cost-effective in the Web services model. Aberdeen analysis indicates that, as Web services evolve and other forms of services emerge, a portal approach to all content and communications will be the focal point for accessing and providing mission-critical distributed application components. Indeed, the broad adoption of Web services promises to add a new dimension to the productivity and nimbleness of workers and customers alike.

Portals that react to an individual's valued and retained profile will solve many of the issues of information overload and applications chaos. Portals provide aggregation, organized presentation, knowledge management, provisioning, and secure access to services in a personalized way. A portal server also manages multi-device access to services based on role, identity, and presence — in real time.

Aberdeen recommends that enterprises adopt a portal strategy for managing the information overload of today, while setting the stage for the swift advancement of contextual Web services. In doing so, careful consideration should be given to selecting a portal built on a battle-tested, open platform that will stand up to demands for scale, as well as technologies yet to come.

Context Is King

The most compelling presentation of information — replete with interactive visualizations designed for a desktop — is meaningless when sent to a PDA (personal digital assistant). Likewise, a brilliant business proposal offered in English to an individual who speaks only Cantonese is destined for inaction. Context, then, dictates value; it is the difference between mediocrity and excellence.

Web services will become increasingly adept at understanding and responding to the context of a service request. Contextual Web services understand the parameters around any information request — parameters such as user identity and access rights, physical and device details, quality of service (QoS) requirements, bandwidth availability, and transaction priority.

The dynamic determination of the proper response to a specific request at a particular time results in a service that is personalized, effective, and organic in na-

ture. The user experience is enriched because it is an exact match to user requirements and preferences — at the particular time of the request. When contextual Web services connect people in their unique circumstances to a business process, business relationships are strengthened — a win for users and enterprises alike.

The Importance of Maintaining Control over Customer Profiles

The overall value and convenience of Web services hinge on the caliber of the directory profile data. Advanced distributed services over the long term will do nothing to change the requirement to define and refine relationships with workers, resources, partners, and customers. The key to gaining control over runaway resources and information — and what gives Sun the ability to accomplish complex tasks — is the cohesive directory infrastructure.

A secure, highly scaling, responsive, and standards-based directory is pivotal to the implementation of a long-term and comprehensive directory strategy. When combined with a profile directory of end-user variables, a reliable directory infrastructure can — for the first time — provide a true end-to-end business process application delivery system. Services can be woven together into a fabric that fits each business constituency like a glove, rather than remain a patchwork quilt that purports to cover everyone.

Directories Define Context, Organization, and Order

In addition to the benefits of proper directory architecture, Services on Demand also leverage a “communications access stack,” which allows myriad interactions between users, applications, and resources. The Sun ONE platform offers an access stack that is closely aligned with the directory — which Aberdeen sees as a significant advantage.

This alignment allows the communications actions and circumstances to feed contextual definitions to the directory, and, consequently, for the directory to orchestrate the delivery of personalized application results to users. The application content and transactional result are also delivered to other affected applications regardless of network, platform, or the spectrum of device and interface modes.

A directory-based communications access stack is essential to mitigate the negative impact of information overload, while preserving the positive effect of “always-on” digital access. Services on Demand will automatically elevate critical communications to the appropriate level of urgency across any communications mode rather than letting them languish unattended and undifferentiated in a “dumb” in-box.

Managing the Content

Directory and communications are only as effective as the content they manage and deliver. In today’s corporation, finding, refining, and delivering content is a challenge. Finding the content is difficult because that content resides in multiple

systems and repositories spanning a wide range of architectures. Refining the content is problematic when content contributors are dispersed both organizationally and physically throughout the corporation. Delivering content to customers, partners, and employees not only requires that recipients be shown information that is relevant to them, but also that they are shown *only* the information they are authorized to view.

Such a multifaceted challenge requires a sophisticated response. The goal is to foster the use and reuse of relevant legacy, cross-application, and unstructured content from anywhere on the corporate network or the Internet. Such informed “knowledge repurposing” increases the efficiency of business processes by bringing the most valuable information into the context of mission-critical work and process.

The ultimate goal is a multi-object knowledge portal that combines structured and unstructured data and delivers it to specific roles within an enterprise — or externally meters it to end-users in ways they can digest and use. Affiliated technologies such as XML (eXtensible Markup Language), information taxonomies, and industry-specific tagging conventions will only help to improve the flow of information.

The Power Behind the Portal

The portal is in place, prepared to deliver information that is personalized and context-aware. So far so good. However, Aberdeen cautions that Web services are prone to a paradoxical network effect: The more successful a service is, the more vulnerable it becomes to issues of scale and service quality. The reason is that successful Web services are “rewarded” with the most demand.

Without adequate design and infrastructure, the best Web-enabled applications are unable to respond to demand. Large quantities of information are demanded from the service, and even more information floods into it. Applications that cannot instantly meet that demand quickly become unproductive, providing slow service or just crashing altogether.

Unfortunately, if a business wastes end-users’ time with inconvenient or faulty Web service, it damages the Web experience and devalues the Web service. If the customer cannot trust that a transaction will be performed, he or she simply won’t initiate the transaction. In this competitive market, poorly architected Web services will rarely get a second chance. There is no shortage of competitors to attract disenchanted customers with higher convenience, QoS, and relevance of information.

To borrow from an axiom, a portal is only as powerful as the infrastructure on which it is built. The complexity of evolving Web services, joined with unpredictable loads, requires that portals be built on a platform stack that is easy to integrate and “future-proofed.” The degree to which a platform stack is integrated is critical for effective control over systems, communications, content, process, and

workflow. An “integratable” stack provides the ability to swiftly deploy standards-based, best-of-breed infrastructure components, rather than being locked in to a single proprietary silo of operating system functions.

The stakes are extraordinarily high. The value of worldwide business-to-business (B-to-B) Internet transactions currently hovers at just under \$1 trillion annually. The combined dollar value of these transactions is projected to reach \$5 trillion to \$6 trillion by 2005. The enormity of this potential should galvanize corporate executives to approach Web services as a strategic undertaking with the dual benefits of cutting costs while building new business.

Services on Demand and the Sun Open Network Environment (Sun ONE)

Sun has a clearly articulated vision for Services on Demand: the delivery of services anywhere, at any time, and on any device by leveraging and tying together different technologies — e.g., legacy applications, Web applications, and Web services — to address specific business issues. In short, it’s a matter of evolution, not revolution.

The Sun Open Net Environment (Sun ONE) is Sun’s standards-based software vision, architecture, platform, and expertise for building and deploying Services on Demand. It provides a highly scalable and robust foundation for traditional software applications as well as current Web-based applications, while laying the foundation for Web services and Services on Demand. The Sun ONE platform comprises four key elements:

1. *Vision* — a model in which an enterprise’s infrastructure is able to provide information, data, and applications to anyone, anywhere, at any time, and on any device.
2. *Architecture* — an open, standards-based, end-to-end software architecture for integration today, and a solid foundation for future services.
3. *Platform* — an open, easy-to-integrate product portfolio that addresses immediate business requirements, enabling current and emerging Web services.
4. *Expertise* — Sun’s 20 years of experience in delivering cost saving, business-ready networked solutions from Sun Professional Services, iForce partners, and SunTone certificated partners and programs.

Sun’s vision articulates the business objective of Services on Demand as the ability to build, maintain, grow, and ultimately monetize communities — be they shareholders, customers, suppliers, partners, or employees. The key challenge is to deliver Services on Demand to any target community — in real time.

Services on Demand — with both loosely coupled interactions *and* tightly coupled programmatic and transactional activities — should easily integrate with existing applications and systems. They will support existing Web services, as well future

classes of services. Along the way corporations should ensure that they maintain control over their directories and customers.

The Evolution of IT to Web Services

The benefits of Web services fit very well into larger, evolving trends affecting corporate computing in general. For example, enterprise platforms and content have followed a progression from:

- Index files to proprietary data formats to shared data.
- Desktop to Web site to portal.
- Communications to groupware to business process.
- Tightly coupled services to Web services to services on demand.
- Workgroup to enterprise to business ecology.

Leveraging these trends, and taking its core platform competencies to new heights of integration, Sun has, with the Sun ONE architecture, built a Services on Demand development and deployment platform. The value of this initiative comes from the ability of businesses to concentrate on the higher order of computing — portals, managed knowledge, shared data, business process, and Web services — rather than being trapped by systems disparity and information overload.

As stated previously, Web services are collections of functions that are published to the network for other applications to identify, access, and use. The technology is built on open interoperability specifications such as XML, Simple Object Access Protocol (SOAP), Web Services Description Language (WSDL), and Universal Description, Discovery, and Integration (UDDI). Key attributes of Web services include:

- Legacy applications can be exposed and shared as service components;
- New business process development greatly benefits by leveraging new and existing service components;
- Componentized services can self-define their capabilities and automate a business process or undertake workflow on their own accord;
- Web services containers separate QoS issues such as security and scalability from business logic development and implementation; and
- Components represent both loosely coupled interactions and programmatic and transactional application activities.

As Web services components become infused with increased adaptability, and the infrastructure supporting them is guaranteed as fail-safe, then Web solutions become “smart” — i.e., capable of delivering Services on Demand. In response to a specific request or demand, these services are produced by the dynamic combination of openly available components to define their outputs to users through finely grained and real-time context.

For example, with Services on Demand:

- Business executives gain automated access to the right knowledge and expertise to act quickly and decisively;
- Application developers focus on continuous business process automation and improvement;
- Employees and partners receive personalized service and interoperability without information overload; and
- Customers and prospects receive valued information and productive services that save time, engender trust of service, and lock in a long-term business relationship.

With Services on Demand, what qualifies as “best-of-breed” is no longer static — it changes to meet the real-time needs of the individual, the business community, or the marketplace. As a result, the providers of services can focus on accomplishing their core objectives (selling goods, providing select information, adding value, transferring funds) without being bogged down by the method, mode, or medium that delivers that objective (Table 1).

Table 1: Benefits of Web Services

Web Service Feature	Technical Advantages	Business Advantages
<ul style="list-style-type: none"> • Publish features and availability through standard schemas 	<ul style="list-style-type: none"> • Expose business functionality • Hide code-level complexity 	<ul style="list-style-type: none"> • Per-process flexibility to adjust to changes in business and regulatory environment on an ongoing basis
<ul style="list-style-type: none"> • Dynamically discover and engage other Web services based on runtime requirements 	<ul style="list-style-type: none"> • Engage only resources required for each transaction • Use existing applications, infrastructure, and hardware without wholesale upgrades 	<ul style="list-style-type: none"> • Customize responses to individual requests • Decrease development costs • Improve user service and satisfaction
<ul style="list-style-type: none"> • Element-level, runtime decision-making ability 	<ul style="list-style-type: none"> • Flexibly adapt to changing network and resource demands and availability 	<ul style="list-style-type: none"> • Decrease operating costs, employing available resources instead of creating new ones
<ul style="list-style-type: none"> • Reusable services 	<ul style="list-style-type: none"> • Flexibility and interoperability 	<ul style="list-style-type: none"> • Simplified development
<ul style="list-style-type: none"> • Service container deployment architecture 	<ul style="list-style-type: none"> • Consistent security, scalability, availability, and implementation and deployment 	<ul style="list-style-type: none"> • Simplified development and higher QoS

Source: Aberdeen Group, September 2001

Value Proposition of the Sun ONE Platform

Because today's competitive reality demands that QoS increase while costs simultaneously decrease, services need to be built from information assets that are already common to all organizations — databases, applications, reports, and transactions (i.e., anything that initiates or acts on transactions), hence the Sun acronym "DART." The Sun ONE platform employs solutions from the Forte, iPlanet, and Solaris product lines to enable Services on Demand (Figure 1). The Sun ONE platform includes the following:

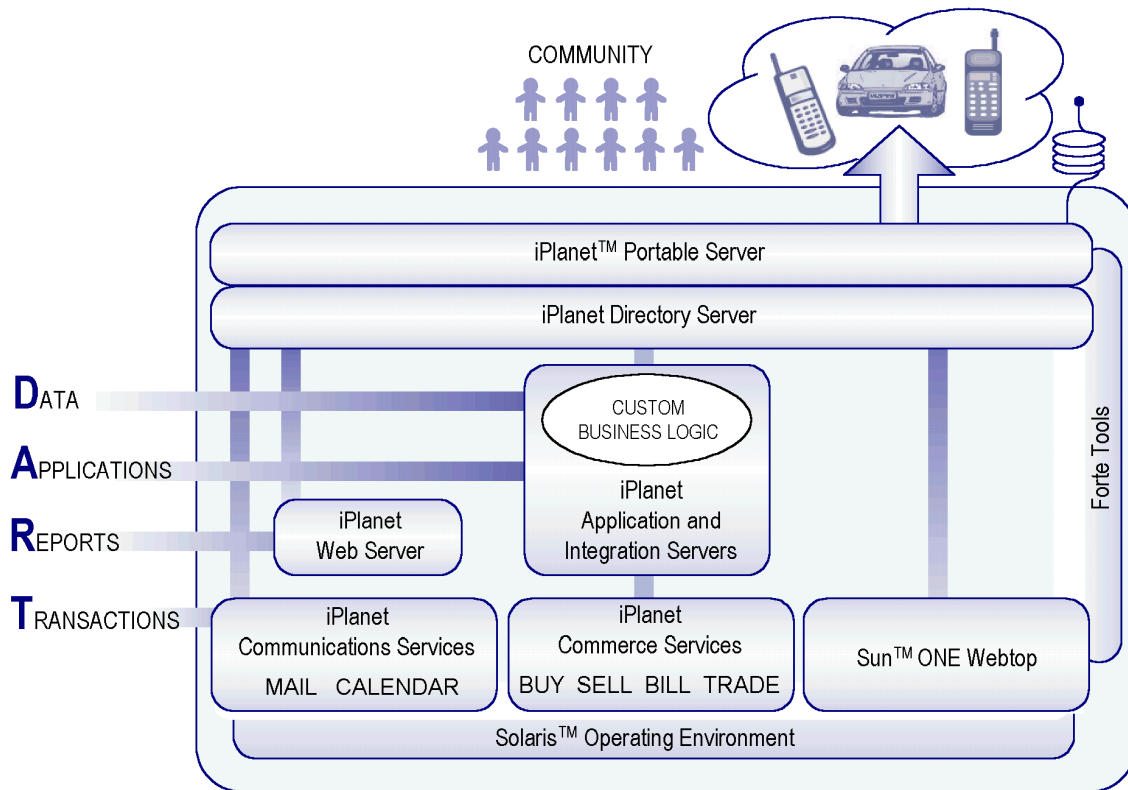
- *iPlanet Directory Server* — LDAP-based directory servers that enable user management to create a community with defined profiles, permissions, and policies. The result is a high-speed, scalable, self-replicating, self-synchronizing data structure leveraging multi-master capabilities to provide unified directory services across multiple directories.
- *iPlanet Portal Server* — provides next-generation presentation and interaction, enabling personalization, custom layout, syndicated content, secure remote access, and wireless remote access.
- *iPlanet Web and Application Servers* — enable the delivery of Services on Demand with a highly scalable platform for business logic written in the Java programming language, with hooks to legacy database and applications. Architected for horizontal scalability, the servers are based on Java technology and Java 2 Enterprise Edition (J2EE).
- *iPlanet Integration Server* — provides service interoperability and application integration with legacy, packaged, or custom systems, as well as new back-office environments. Its workflow-based engine allows a business analyst to pull together workflows from various systems to create services. iPlanet ECXpert allows secure document exchange using EDI and XML. The suite includes EAI Edition, B2B Edition, and iPlanet Message Queue for Java, a message-oriented middleware (MOM) solution.
- *iPlanet Communications Services* — include mail, calendar, and enterprise-class instant messaging.
- *iPlanet Commerce Services Portfolio* — provides services to buy, sell, bill, and trade products and services. Built as Java components running on iPlanet Application Server, they include iPlanet BuyerXpert for E-Procurement, iPlanet SellerXpert for online selling, iPlanet BillerXpert for Internet bill presentment and payment, and iPlanet Market Maker for auctions and exchange-based services.
- *Forte Tools* — enable developers to design, create, and assemble Services on Demand. They include Forte for Java, Forte Developer, and iPlanet Unified Developer Server.

- *Solaris Platform* — Sun Solaris Operating Environment and Sun Cluster provide a high-reliability foundation on which to build and deploy Services on Demand.

Leveraging Sun’s Services on Demand Expertise

Sun’s extensive installed base with service providers and enterprises has put its services group, its iForce program, and its system integrator partners on the leading edge of experience in Services on Demand development and deployment. Sun experts — in concert with partners such as Accenture, Cap Gemini Ernst & Young, CSC, Deloitte Consulting, EDS, and PricewaterhouseCoopers — help firms architect, deploy, and manage an open and scalable Sun ONE product infrastructure for Services on Demand, from today’s applications and Web services to new kinds of services yet to emerge in the future. These experts are expanding a “best practices” knowledge base to achieve operational cost efficiencies and speed delivery of new applications.

Figure 1: Technologies and Products in the Sun Open Network Environment



Source: Sun Microsystems, October 2001

The Role of Sun Partners

Sun's open standards framework encourages collaboration with customers and partners. Although the Sun ONE platform provides all of the tools needed to build Web services, Sun works closely with partners for specific business-level Web services and interoperability support. The SunTone certification program ensures maximum technical interoperability as well as co-marketing and cross-selling opportunities for SunTone partners.

For example, Sun enables an enterprise's employees to leverage content management solutions from best-in-class suppliers such as Vignette and Interwoven. The Sun ONE platform also allows integration with existing infrastructure systems, such as Netegrity's user access control or application servers from other suppliers.

Sun's Differentiation in the Web Services Market

The concept of Web services is industry-wide — a clear direction in which the technology industry and business requirements are moving. Services on Demand and the Sun ONE platform are Sun's vision for anytime, anywhere access to the best, most appropriate service based on the user, resource, or application context.

Sun's differentiation can be summed up in three concepts:

1. The Sun ONE architecture solution is evolutionary, embracing existing systems and ROI (return on investment) models while affording Services on Demand flexibility.
2. The Sun ONE platform is open — a non-negotiable factor for effective delivery of Services on Demand — built on open interfaces and industry standards such as LDAP, J2EE, IMAP4, SOAP, UDDI, and ebXML. Sun has also committed to embracing other standards as they emerge. This open architecture lays a future-proofed foundation that also leverages the past.
3. The Sun ONE platform is easy to integrate. Architected to consist of well-integrated products, the solution also readily accommodates products from other suppliers that employ open standards.

Sun starts from a powerful base with its commitment to Java technology — now well accepted as an enterprise-application development platform. The Sun ONE vision builds on this platform with proven hardware and infrastructure software from Sun and iPlanet for Web services and for creating, deploying, and maintaining Services on Demand.

Aberdeen Conclusions

Because of the self-defining and automated nature of Web services, complex “ecologies” of application services will put a significant burden on any organization's ability to manage systems overload and information chaos. Such complexity will

have unknown consequences on infrastructure, interfaces, and the behavioral absorption of the services by end-users.

An integrated portal approach to applications that span enterprises is the front line in combating information chaos. A unified and scalable infrastructure under that portal, which the Sun ONE platform offers, harnesses and wields user access, policy, and content for the business organization's benefit. Aberdeen concludes that this infrastructure is an essential offensive capability in the next chapter of Internet and mobile commerce.

Under a portal umbrella, directories, content management, and communications services need to be deployed in an integrated fashion on a rock-solid Internet infrastructure to head off an "information explosion" and consequent systems overload. Businesses need to project trust of service by encouraging users to sign up for solutions that operate contextually with other trusted services, thus producing highly valued Services on Demand across the digital economy.

In a nutshell, Sun offers to provide the electronic blueprints as well as the picks and shovels to the architects and miners of Web services. With its Sun ONE platform, Sun allows its customers — those with a stake in delivering and using Web services — a utility-grade infrastructure that delivers trust of service.

Businesses today should be building the portal-based foundation that they will need to provide trust of service to their customers — before better prepared companies erode their revenue base. Aberdeen finds that a Services on Demand architecture, built and managed on the Sun ONE platform, offers a clear roadmap for reducing the risk of information overload for new and old applications alike.

*Aberdeen Group, Inc.
One Boston Place
Boston, Massachusetts
02108
USA*

*Telephone: 617 723 7890
Fax: 617 723 7897
www.aberdeen.com*

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Aberdeen Group is a computer and communications research and consulting organization closely monitoring enterprise-user needs, technological changes and market developments.

Based on a comprehensive analytical framework, Aberdeen provides fresh insights into the future of computing and networking and the implications for users and the industry.

Aberdeen Group performs specific projects for a select group of domestic and international clients requiring strategic and tactical advice and hard answers on how to manage computer and communications technology.