

Grand Central Communications™

*Lowering Cost, Complexity and Deployment Time
With Integration On Demand™*

A Grand Central Communications White Paper

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Executive Summary

Grand Central Communications delivers Integration On Demand™ at a fraction of the cost that enterprises currently spend on software-based integration projects. Grand Central's Network represents a new and far better model for companies to integrate with customers, partners and internal business units. Delivered as a subscription-based service built on top of the Internet, Grand Central lets businesses pay for usage, not software and hardware.

Grand Central's highly scalable and fully managed network service plugs directly into a customer's IT infrastructure through a single connection, creating a multi-party, business process platform. Once connected, enterprises can combine, orchestrate and share services with any other organization on the Network, regardless of technology differences. The Network handles the complexity and translates different data formats so that business services and processes can easily interoperate.

A business service created on Grand Central can be shared with others through Grand Central's Global Services Directory, which allows services to be published privately to specific partners or publicly to any Network subscriber. The Services Catalog is the world's largest directory of publicly available Web Services, and creates opportunities for enterprises or entrepreneurs to create and sell new commercial services.

Integration On Demand is powerful and unique for three primary reasons:

- Its service-based model means customers don't have to build their own, lowering the cost, complexity and time to integrate through a shared infrastructure.*
- Its Global Services Directory provides a mechanism for newly created services to be accessed, combined, and shared throughout the value chain.*
- Grand Central acts as a neutral, third party to mediate the business, technology, and philosophical differences that occur with integration. No software vendor is in a position to provide this benefit to enterprises today.*

Contrast Integration On Demand to traditional software-based integration projects, which Forrester Research reports come in on schedule and on budget less than 35% of the time. Now Grand Central offers a feasible alternative.

Grand Central's underpinnings lie in its loosely coupled integration "stack," built as a Service Oriented Architecture and delivered as a service. Grand Central's SOA stack removes much of the risk associated with any integration project. Enterprises seeking modern integration can opt to build and maintain a similar integration stack themselves, and require every trading partner to do the same. Alternatively, they can subscribe to Grand Central, pay as they go, and let Grand Central manage the complexity.

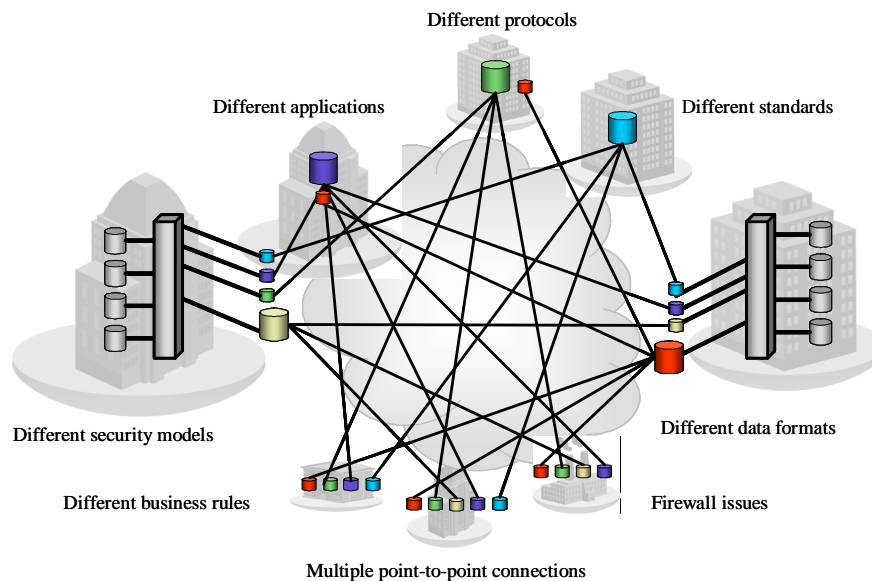
The premise is simple, but radical – lower cost, lower complexity and faster deployment, resulting in better collaboration and increased productivity.

Industry Challenges and Market Trends

"Companies of all sizes see no return on the investments they've made. They've got a hodgepodge of platforms, they're spending lots of money trying to get them to run, and they're not going to spend any more money until someone helps them connect this stuff in a way that makes economic sense."

-- John Hagel, III—Author of *Net.Gain and Out of the Box: Strategies for Achieving Profits Today and Growth Tomorrow Through Web Services*

One of the biggest challenges facing virtually every organization today is the need to integrate and share business processes with their customers, partners, and diverse business units – flexibly, cost effectively, and on demand. But differences in technology, multiple security models and the hundreds and hundreds of different ‘standards’ that exist have become obstacles to interoperability instead of enablers. Until now, technology solutions have addressed only a fraction of this problem, and they are costly, complex, and prone to failure.



How big is the problem?

- Over 70% of today's IT budgets are dedicated to solving integration issues¹
- Less than 35% of integration projects come in on time and on budget²
- For each \$1 of software, consultants spend \$5 installing and fixing it³
- And for each \$1 spent on software, customers will spend 6-8x on services⁴

Challenges with the traditional approach:

Traditional software-based integration approaches were designed for static, one-to-one connections, not the many-to-many, on demand connections required by today's businesses. With traditional solutions, enterprises face the following issues:

- **Cost and time to develop and deploy initial software integration solutions** -- each partner requires software, hardware, staff and knowledge to implement and manage multiple point-to-point connections, often limiting integration to top-tier partners.

- **Hidden cross-platform compatibility costs (30-70% of total cost of software development)** -- making integration software compatible with the underlying operating systems, databases, application servers, mail servers, directory servers, and testing each platform, supporting each platform, etc.
- **Lack of flexibility and ongoing maintenance costs** – the solutions are often so complex that once completed, they are difficult to change, maintain, and scale.
- **Inability to share/reuse assets created** – without a common platform to make newly created services visible and available, today's model is not designed to share value creation.

The impact on the enterprise customer is that a significant part of the cost of software provides little or no business value. At the same time, IT resources are scarce, budgets aren't growing, and IT has more pressure than ever to facilitate improved business performance. In addition to technology costs, customers face business and philosophical issues as well.

Who wins the power struggle?

Each party involved in an integration effort typically has an established set of standards, security models and business practices. One partner may use SSL encryption as their security model, while another uses X.509 Digital Certificates. When multiple partners want to exchange information, whose technology standard is adopted? One partner may have a Service Level Agreement (SLA) uptime standard of 99.98% while another is 99.95% -- whose SLA is honored? Who confirms that the transaction was delivered (or not...) when multiple partners are involved, and multiple boundaries of control are crossed? And what happens when it isn't delivered? The need to drive consensus while developing an integration solution can become an enormous barrier to success. Plus once agreement occurs, it becomes difficult to make changes, because all parties must now move in lock-step. Without a neutral point of mediation, these are complex, often unresolved issues.

The service-based model of software has arrived

Forward-looking enterprises are rapidly adopting a service-based model to streamline operations, slash infrastructure costs and respond faster to market conditions. Successful companies are investing in services that differentiate them, and outsourcing commodity services to organizations that deliver them more reliably and cost-efficiently. Who today would invest in building an overnight parcel delivery service? Likewise, who wants to invest millions in designing and implementing a CRM system when several vendors offer one for a fixed monthly fee that scales dynamically with the growth of the user's organization?

Several converging technology trends have made the service-based model a reality, including *Services-Oriented Architectures (SOA)/Web services, and broadly available high-speed connections*, which together enable IT capabilities to be delivered as a service.

Key technology trend: Service Oriented Architecture (SOA)

With the services model, producers of services make their services available over an SOA backbone, and then consumers of services create applications by weaving together different services. Totally virtual applications can now be created that require no hardware or software deployment. This is aligned with corporate IT objectives to build and deploy services that provide differentiation and to leverage services provided by others.

The key benefits of SOA include:

- **Services only need to run on a single platform**, eliminating compatibility issues.
- **Developers can focus on creating useful business applications**, not porting applications to other platforms.
- **Enterprises can leverage the work of others** in ways not possible with the current model.
- **Time to respond to market demands is shortened** considerably by leveraging others' services.

This service-based approach is more economically responsive to the needs of IT and enables enterprises to focus more on business process and applications rather than deploying more enterprise software.

A Better Way: Integration On Demand

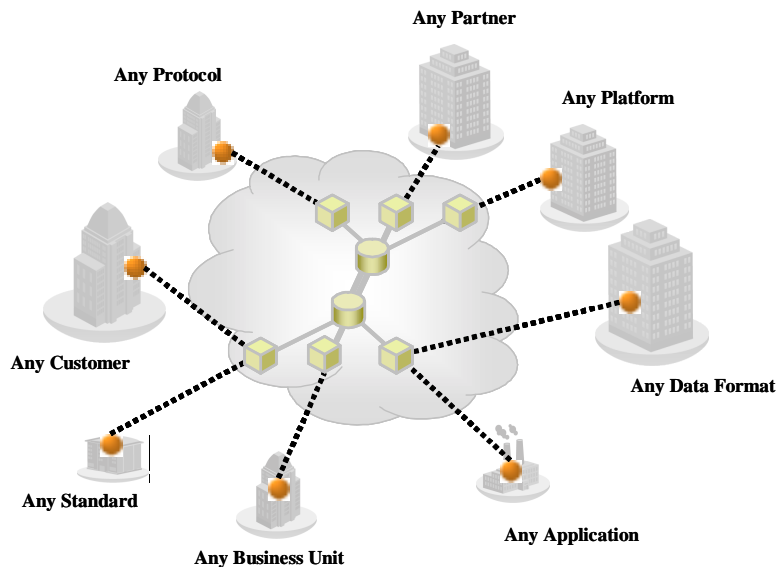
“Xilinx connected to Grand Central's Business Services Network in less than one day, making this one of our quickest and easiest IT integration projects ever.”

-- Sheri Anderson, Chief Information Officer, Xilinx

Merrill Lynch defines On Demand as “**The new software business model that enables organizations to reduce costs, optimize time and minimize risk through term based licensing and outsourced delivery solutions.**” They believe that “the value proposition offered by the On-Demand model could lower the overall cost of deployment by 5x-10x compared to traditional implementation models...not only in the upfront license and maintenance fees but perhaps more importantly in the hidden cost areas such as customization and implementation, hardware, labor, training and upgrades.”

What is Integration On Demand?

Winner of *InfoWorld Magazine's* 2003 “Web Services Integration Solution” Technology of the Year award, Grand Central's innovative Integration On Demand model represents a powerful new way for companies to interoperate. This subscription-based service enables the integration and sharing of information, services and business processes on demand between enterprises, their partners, customers and internal business units.



Integration On Demand lets businesses pay for usage, not for proprietary software and hardware. It creates a broad, multi-party business process platform where companies can rapidly connect and share business processes when and how they need them, regardless of technology differences, and without adding additional infrastructure. The premise is simple but radical – faster deployment with lower cost, less risk, and less complex integration.

Integration On Demand is composed of three powerful and unique attributes:

- **Service Based Delivery Model**
- **Ability to Access and Share Assets**
- **Neutral Third Party Mediation**

Service Based Delivery Model

Grand Central has built and maintains a complete, standards-based integration stack – delivered as a subscription service – so that customers don't have to build their own. Throughout history, shared infrastructures have served as platforms for major advances:

- The mobile telephone industry uses a shared wireless service infrastructure so that cell phone service providers can seamlessly switch a user's call from one network to another, to reach a caller who subscribes to a different service provider.
- The same is true of the train system – each railroad doesn't build all of its own tracks; instead, they own some tracks and pay to use others owned by other railroads as shared infrastructure.

Grand Central's approach works on the same principles and *reduces the cost, complexity, and time* to integrate, without the burden and expense of dedicated resources to manage a commodity infrastructure. The service-based delivery model provides the following benefits:

- **No need to invest in additional hardware, software or staffing.**
- **No ongoing maintenance and upgrade fees.**
- **User support, cost of change and lifecycle costs are essentially eliminated.**
- **Grand Central (not your IT department) incorporates new standards**, manages changes to security policies and handles software upgrades.
- **Rapid Deployment** -- companies can be up and running in days to weeks -- not the months typically required with software deployments.
- **The Network is *scalable and flexible*, without additional investment**, allowing customers to use as many connections, services and processes as they need, and rapidly change as their business requirements change.
- **You pay only for success** due to the subscription-based model.
- **No vendor "lock-in"** - Grand Central incorporates emerging standards and legacy protocols as customers require them. This avoids "lock-in" to a single vendor's platform, and ensures that business processes are portable to other platforms.

Ability to Access and Share Assets

Once the issues of integrating differing technologies, standards, protocols and devices are solved, Integration On Demand becomes a powerful platform for combining and sharing services and business processes. Enterprises and third-party solution providers can easily discover, access, combine, and publish services for others to use, through a simple, wizard-based interface. Security policies can be set to control how the services must be viewed, accessed and consumed. Everything created on Grand Central can be shared with your entire value chain, without intervention from your service provider, which speeds adoption by your partners and customers.

Additionally, because Integration On Demand is open and standards-based, users can tap into a huge pool of available resources to extend solutions – from millions of Java and .NET programmers to thousands of software applications and hundreds of tools from major vendors. This model provides virtually unlimited extensibility to expand business process solutions. As a powerful, shared platform for business integration, the Network becomes even richer in value as the number of participants, services and business processes grows.

Neutral Third Party Mediation

Grand Central acts as a neutral, trusted intermediary, to enforce, monitor and mediate technical and philosophical differences on behalf of service producers and consumers.

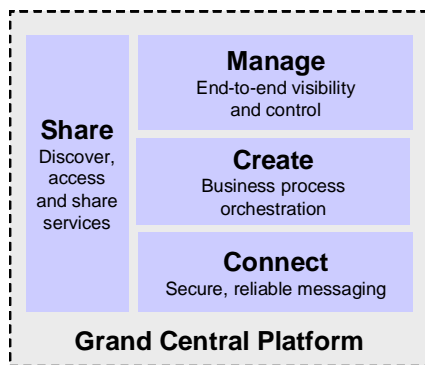
Here are examples of where this role is useful:

- **Enabling partners to participate in the Network** with the technology, standards and business practices they currently use, while the Network mediates the differences. For example, using whatever authentication and encryption technology they want, or using the attachment protocol (MIME, DIME, etc.) that they prefer.
- **Monitoring and mediating differences in partner SLA’s** such as availability, performance standards, up-time commitments, etc.
- **Tracking a long-running business process** or transaction that crosses multiple control boundaries, and issuing a notification of error condition to the parties involved, based on the criteria they’ve set, and in the form they want to receive it (email, pager, phone, etc).
- **Authenticating a transaction** involving multiple parties.

No software vendor is able to fulfill this role in a neutral, non-biased way – it requires a third party intermediary such as Grand Central, to provide this capability.

An Overview of Grand Central’s Service

Built on top of the Internet using a loosely coupled, Service Oriented Architecture as the backbone, Grand Central offers a highly scalable and fully managed Network Service. *Grand Central is the fastest, simplest, and most cost-effective way to **Connect, Create, Share, and Manage** information, services and business processes with anyone, anytime, anywhere.*



Once connected, customers can combine, orchestrate and share services (reusable, standards-based software components) with any other organization on the Network, whether internal or external.

The Network handles the complexity and translates different data formats so that business services and processes can easily interoperate.

How does it work?

Grand Central's SOA backbone plugs directly into a customer's IT infrastructure through a single connection. For customers that are evaluating an SOA for their enterprise, Grand Central's SOA provides a turnkey capability. For customers that already have an internal SOA, Grand Central's SOA can extend the same capabilities beyond their firewalls to customers and partners.

In addition to connecting trading partners, Grand Central provides a valuable new development platform and set of reusable services for corporate and independent developers. As developers orchestrate and deploy new services-based applications on Grand Central, or "wrap" existing enterprise applications to turn them into reusable services, new business processes are created, which can be further shared.

Example: Integration On Demand in the Financial Industry

Wachovia Financial buys data from more than 130 data sources for its 200-plus securities analysts. Previously, each data source required a separate, point-to-point integration between the data source and Wachovia. For example, Thomson Financial, one of Wachovia's data suppliers, connects using ASP.net, while Wachovia connects using a standard SOAP toolkit. This presented many compatibility problems.

Stock analysts at Wachovia use Grand Central to download Thomson Financial data on consensus Wall Street earning estimates into Excel spreadsheets, so they can monitor how their research recommendations change the estimates. With Grand Central, data can now be shared seamlessly, regardless of the protocol or data format of the source. Wachovia's connection to Grand Central took a day and a half, and Wachovia can easily add other data vendors without any additional work.

Connect Securely and Reliably

Grand Central enables secure, reliable messaging and provides a broad range of connectivity options, including:

- Traditional file- and batch-based systems (such as FTP)
- Evolving standards such as EDI/AS2, XML/HTTP and Web services protocols
- A wide range of legacy applications (SAP, Siebel, Oracle, etc.) and connectors for existing enterprise software
- Web portals, application servers, Microsoft desktop applications and handheld devices
- Any software designed to Web services standards

The differences in mode of connectivity or data format are reconciled by the Network instead of the traditional method of "hardwiring" them within applications, which makes them labor-intensive to change.

Customer Example: Wachovia becomes technology leader due to Integration On Demand

Wachovia wanted to be among the first financial institutions to publish financial reports in RIXML, an emerging standard for the securities industry. One intended recipient of the reports was the Thomson Financial Web site, Worldstreet, which only accepted reports by FTP.

Wachovia now delivers the RIXML reports to Worldstreet via Grand Central's Service. The Network translates RIXML to FTP. Wachovia also publishes the reports in PDF format, which persists within Grand Central for 90 days to meet regulatory requirements. By using Grand Central, Wachovia was able to satisfy its partner requirements, regulatory requirements, and lead its market in announcing support for the RIXML standard.

Data Format Mediation

To mediate data format differences, Grand Central utilizes a comprehensive suite of semantic data-mapping tools. An industry-standard XSLT service performs mapping between XML-based data formats using maps easily created through a wide variety of publicly available XML tools. For advanced management and authoring of data maps, Grand Central provides a fully featured mapping service based on award-winning Contivo technology. Contivo is also used for EDI and flat-file formats.

Security and Trust

Enterprises maintain trusted relationships with many organizations, each with different access, authentication and encryption technologies, which can create power struggles between partners when attempting to integrate. Grand Central resolves differences in security policies through a policy framework based on WS-Policy and WS-Policy Framework standards.

Grand Central acts as a buffer between the Internet and its customers' internal networks, shielding them from outside attacks. Standard perimeter defenses are used, such as firewalls, intrusion detection systems and standard physical security measures. Connections between enterprises and Grand Central are secured with 128-bit encryption. Identities are verified with user name/password or X.509 digital certificates such as Verisign provides, and industry standards such as SSL, IPSEC and VPNs are supported. The Network also provides tools for non-repudiation, and is fully extensible to cover other widely adopted standards.

Customer Example: Grand Central Mediates Security Differences

Grand Central customer Xilinx, a fabless chipmaker, regularly needed to exchange test results data on quality standards with IBM Microelectronics, one of its strategic foundries. Security protocols between IBM and Xilinx differed greatly.

Xilinx turned to Grand Central to mediate the security differences between the two parties through its policy engine. Xilinx did not modify its technology infrastructure but continued to successfully exchange test results data with IBM.

Create, orchestrate and deploy business processes

Grand Central offers a rich, open-standards development environment with the fundamental building blocks, utilities and services required to orchestrate and deploy many-to-many business processes on the network: Grand Central's Business Process Building Blocks include:

- *Message Routing for Simple Business Process Orchestration* – An easy-to-use, flexible Message Routing Service that enables customers to chain together services from multiple parties to form business processes.

- *BPEL4e™ for Complex Business Processes* -- The Business Process Execution Language (BPEL) standard defines how business processes can be assembled and orchestrated into useful business applications. Grand Central's BPEL4e (BPEL for everything) is the first commercially available implementation of BPEL version 1.1 (also known as BPEL4WS, or BPEL for Web Services), delivered in an open, service-based model. This means that BPEL scripts can be executed in the Network without deploying software or hardware. Although BPEL is a Web services standard, BPEL4e can orchestrate non-Web services processes as well, including EDI and FTP.
- *GC ProcessExpress™ to Visually Model and Deploy Business Processes*
Grand Central's Visual Process Editor makes it easy to assemble business processes by providing a "drag-and-drop" graphical environment. Once new services are assembled and published into Grand Central's Directory, they can be reused with other partners.

Key to this offering is the ability for customers to reuse services, and create shareable, new value by leveraging and combining existing assets. In addition, legacy applications or API's can easily be enabled and made available as services on the Network.

Customer Example: Putnam Lovell manages key business processes in the network

Putnam Lovell, a private investment bank, wanted to deliver research reports to interested investors. Putnam uses Salesforce.com to maintain customer data used to determine who gets which reports. Another vendor, Blue Matrix, distributes these reports to customers.

Now, through an automated business process in Grand Central's Network, Blue Matrix queries Salesforce.com for a list of customers interested in a particular topic. Customer profile data is automatically transmitted from Salesforce.com to Blue Matrix, which mails the reports to relevant clients. No human intervention is required throughout the business process – it is executed entirely in the Network.

Share and access services

Once a service or business process is created on Grand Central, it can be made available to others through Grand Central's Global Services Directory. Network subscribers can dynamically discover, access, reuse and share services and business processes on demand, and incorporate them into their business processes. This unique aspect of Grand Central provides the ability for enterprises to share new value creation with their extended value chain, with full control over how the asset is used.

Private Directory Services

With enterprise-class private directory services, businesses can provide visibility to proprietary services by publishing them privately to customers, partners and internal business units. Comprehensive access rules and security policies allow easy control over who gets to view, compose and use services and business processes. For enterprises that already utilize internal LDAP directories for access control within their own networks, their enterprise directories can be integrated into Grand Central.

Grand Central's Services Catalog

Designed to be the world's largest high-quality, professionally managed catalog of publicly available services, Grand Central's Catalog includes hundreds of Web services and business

services. Reusable business services, such as billing, credit checks and name and address verification, are publicly available and can be consumed in any business process by Network subscribers. The Catalog also contains Grand Central utilities, software applications, tools from major vendors, and services from software entrepreneurs that choose Grand Central as their development platform. Anyone can expand the reach of their services by publishing them in Grand Central's Services Catalog.

The Services Catalog is searchable by service, category or Business Service Provider (BSP). It is organized into a broad range of categories, from business to travel to Web services. Hundreds of leading Web services, ranging from fax services to XSLT data transformation to the SEC's EDGAR database, can be accessed from the Catalog and incorporated into business processes. Soon hundreds of thousands of services will be available.

Business Service Providers can reach a broad array of potential users by publishing their business services to the Catalog, defining their own classification categories and branding. The entire Catalog can be syndicated for use on others' Web sites as a Directory, further extending its reach. This creates business opportunities for enterprises to resell their proprietary services, and for entrepreneurs who choose Grand Central as a platform to create and sell new commercial services.

Policy Definition and Mediation

Grand Central's policy framework governs the Network's ability to mediate differences, based on predefined policies set by each Network subscriber. Organizations can easily define relationships between users and services including access and visibility policies, as well as user profiles. The network manages the identity of each user and their access rights. Authentication and security rights are also managed through the policy framework.

Manage your distributed processes with visibility and control

Administrative controls allow users to monitor, manage and customize the Network. These tools aid change management, service level agreement (SLA) monitoring, exception management, long-running transactions, and real-time visibility to the Network through a simple, Web-based interface.

Customization and Branding

Grand Central's rich set of development tools enable customers and third parties to brand the Network under their own names if they choose. For example, Wachovia Bank has customized Grand Central's Network to carry Wachovia's name, branding and user interface.

Tracking transactions

A unique tracking ID is issued for each interaction on the Network, spanning simple point-to-point data exchanges to long-lived, multi-party interactions. Because transaction data persists in the Network, participants can conduct long-running transactions that stretch over weeks or months and involve multiple parties. These message-tracking and correlation capabilities create audit trails to resolve disputes, providing proof of who sent a message, when it was submitted, and when that message was delivered to the intended recipient.

SLA monitoring, reporting and exception management

Grand Central provides visibility into every aspect of interactions on the Network. Customizable reports on status, service history, business process or data relationship allow users to trace messages and transactions. Users configure event-handling mechanisms with rules for a wide range of exceptions.

Alerts can easily be programmed into business processes so they run on auto-pilot unless a problem occurs. Once activated, alerts can be directed to other services on the Network or to alert monitors on participants' systems so they can be integrated into enterprise management systems. Alerts can also be converted to e-mails, pages or faxes to key individuals.

Change management features

Grand Central's loosely coupled system makes it easy for participants to change their connectivity, data formats and security choices without affecting other participants. Unlike one-on-one integrations where every change forces partners to adjust, Grand Central's Network manages those changes without other users knowing.

Network Architecture

The underpinnings of Grand Central's Network lie in its loosely coupled integration stack, built as a Service Oriented Architecture.

Grand Central's SOA stack

With Grand Central, the integration "stack" is delivered as a service, making features available to subscribers in a scalable, self-service manner that supports configuration versus coding. Each element in the stack is extensible and supports a wide range of standards and protocols.

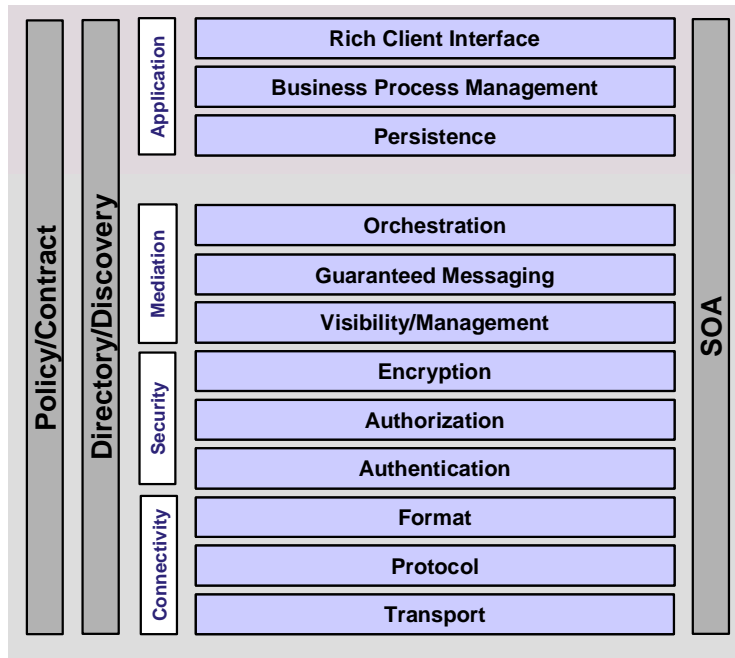
This value of Grand Central's SOA stack is delivered immediately to subscribers, removing a large part of the risk associated with any integration project. Security and management are already built into the service, not delivered as an afterthought. The SOA is managed to a Service Level Agreement (SLA) of 99.95% uptime. This automatically raises the SLA of all participants to this level, whether they are occasionally connected through a spreadsheet or connected into their own reliable backbone.

Grand Central's Network Technology Stack

Grand Central's network architecture carries four critical core values:

- **Loose coupling and late binding**
- **Integrated development tools**
- **Directory/discovery process**
- **Build on the principles of SOA**

Grand Central's Network Technology Stack



Loose Coupling

The loose coupling features of the architecture enable all parties to make changes independently to achieve their own business objectives, without being constrained by partners.

Integrated Development Tools

Grand Central's tool set is seamlessly integrated with the core offering to empower users to create business applications on and in the Network. The Network's ability to provide persistence, and its business process and UI tools let users build sophisticated applications in the Network, removing the need for any hardware or software to deliver the applications.

Directory/Discovery Process

The directory/discovery process is a key ingredient that enables all services and applications to be shared by simply changing the permissions for users and organizations. This enables organizations and individuals to build on the shoulders of giants.

Built on the Principles of Service Oriented Architecture

The fourth important aspect of this architecture is that it was built using the principles of Service Oriented Architectures, enabling new services to be easily and rapidly added and woven together to create new value for all. Anyone can register and permission services in the directory and hence extend the value of the platform.

Summary

“A service-oriented ‘ecosystem’ will enable a new wave of business processes and application innovation.”

-- Gartner Group, December 2003

Grand Central's Network is that service-oriented ecosystem that Gartner predicts for the future. Except that this service is available today at costs significantly less than what enterprises spend today on integration and application development.

Virtually every organization faces the challenge of integrating their business processes with customers, partners and even other internal business units flexibly and cost effectively. With Grand Central, a single connection to its Network delivers instant integration with everyone else connected to Grand Central.

Grand Central's Network represents the future of enterprise computing. Enterprises seeking integration today have two options. They can opt to build and maintain a similar integration stack for themselves, and then require every trading partner to do the same. Or they can greatly reduce their costs and deployment time by subscribing to Grand Central, pay as they go, and let Grand Central manage the complexity of maintaining the integration stack.

About Grand Central Communications

Grand Central provides Integration On Demand through its award-winning subscription-based service, lowering the cost, complexity and deployment time of integration within and beyond the enterprise. By offering integration as a service, Grand Central acts as a neutral, third party to mediate the technical and philosophical differences associated with integration, and enables enterprises to rapidly access and share information, services and business processes with partners, customers and internal business units.

Grand Central's market-changing approach has received significant recognition in the industry, including *InfoWorld's* 2003 Award for "Best Web Services Integration Solution", Readers Choice Award from *.NET Magazine*, Two Thumbs Up from *Web Services Journal Product Review*, and the winner of the 2003 Comdex "Iron Chef" Web Services Competition.

The company is headquartered in San Francisco, California. Call 415-344-3226 or visit www.grandcentral.com for more information.

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4. *Merrill Lynch* Report, "Software Goes On Demand" February 10, 2004

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