

www.Telia.com

Consolidated Telecommunications Services Portal

CASE STUDY

INDUSTRY

Telecommunications
Internet-based customer service

THE COMPANY

Telia AB
Sweden's telecommunications leader

BUSINESS CHALLENGE

- Increase customer loyalty
- Strengthen the Telia brand
- Improve Telia financial results:
 - Increase revenues
 - Reduce operating expenses

KEY SOLUTION REQUIREMENTS

- Provide secure portal access for over 60 independent Telia Web sites
- Deliver personalized information and interactive services to Internet customers
- Develop a scalable, reliable, secure and high performance Web portal solution running on an open UNIX platform

KEY SOLUTION COMPONENTS

- getAccess secure portal software
- Broadvision One-to-One content and personalized software
- Oracle RDBMS
- Sun Enterprise Servers w/Solaris Operating Environment
- Andersen Consulting system integration services
- Telia eCommerce applications and databases

KEY BUSINESS RESULTS

- Telia.se reaches 17% of Internet users in Sweden
- Telia.se is one of top five Swedish Web site brands
- serves over 700,000 unique visitors per month

TELIA'S STRATEGIC TECHNOLOGY DECISION

Selection of getAccess software as the secure portal infrastructure solution for www.telia.se.

"The getAccess solution from Entrust delivers uncompromising security and the availability required to establish fast, responsive and personalized service to millions of customers. Entrust's proven expertise in deploying large scale portals has been a tremendous asset in helping us to deliver www.telia.se services within compressed timeframes."

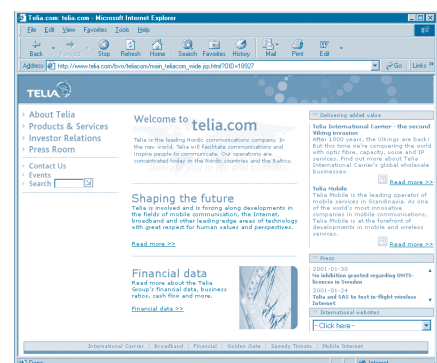
Jan Rudberg
Telia Executive Vice President
Head of People Solutions Business Area

The Customer: Telia, Sweden's Premier Telecommunications Provider

Telia AB is the largest telecommunications operator in Sweden. Owned by the Swedish State, Telia provides a wide range of telecommunications services to several global markets, with primary focus in the Nordic region. Telia's strategy for the next few years is to develop advanced services for customers in Sweden and other Nordic markets, and to pursue targeted international opportunities in key growth areas such as mobile communications, Internet, IP-based networks, broadband services, data communications and international carrier activities. The company has a strong strategic focus on the customer as is reflected in the following corporate statement:

Telia is a company that respects the needs of each individual. Our new brand symbolized that we put customers at the center of everything we do. We challenge technology to liberate you in life and business.

Telia is by far the largest provider of Internet and communication services in the Nordic countries and has nine million subscribers in the region. Sweden is the world's leading nation in Internet access and computer home ownership, making it the most mature nation globally in terms of information technology. It has operations in more than 30 countries on six continents and is the leading carrier of transatlantic IP traffic from Europe to the United States. Telia has more than 30,000 employees worldwide.



Telia's strong financial and customer growth results for the 6-month reporting period from January through June 2000 include:

- Net sales of Swedish Krona (SEK) 26.037 billion (USD 2.66 billion), up 3.4% from the comparable 6-month period in 1999
- Operating income of SEK 3.87 billion (USD 395 million), up 69% from the same period in 1999
- Strong customer growth in mobile services (533,000 new GSM customers in Sweden, Denmark and Finland, 750,000 new GSM customers in Norway), Internet services (80,000 new customers in Sweden), and 120 new agreements to provide broadband services to over 557,000 households

Telia's organizational structure is designed to focus activities on the future and to meet all upcoming challenges. The organization includes five business areas—four core business areas and one for Telia's small, developing subsidiaries and enterprise business management functions:

- **People Solutions.** The People Solutions business area offers fixed and mobile telephony, Internet access and broadband services to the residential and small business markets in Sweden and Denmark. Fixed telephony services are also offered to customers in Finland. The People Solutions business has over half a million Internet subscribers and is planning to launch a broadband portal late in 2000 to offer video-on-demand, educational programs and other online entertainment services.
- **Mobile:** The Mobile business area offers a comprehensive range of mobile communications services to residential and business customers in Sweden and other Nordic and Baltic markets. In addition to basic mobile telephony and services based on mobile communications (such as voice mail and SMS messaging), the business area also markets mobile Internet, satellite telephony and wireless LANs.
- **Business Solutions.** The Business Solutions business area offers a full range of communications products and services to medium- and large-size corporate and public sector customers in the Nordic region. These services extend from basic fixed-line telephony, mobile solutions, data communications and Internet services to Web outsourcing, broadband services and eCommerce solutions.

- **Carrier & Networks.** The Carrier & Networks business area offers capacity in Telia's technologically advanced fixed-line network to other Telia business areas, as well as to third-party operators and service providers in Sweden and internationally. It is divided into two businesses: International Carrier AB, the leading European carrier of transatlantic IP traffic to the United States, and Networks, which has launched a broadband network in Sweden that is undergoing very rapid expansion.
- **Enterprises.** The Enterprises business area comprises developing companies and units that operate independently from the four above listed major business areas. Enterprises also provides Telia's corporate administrative support, technical and other services for all business areas. These include IT and Innovation, System and Service, International operations and InfoMedia.

As a consequence of its customer-centric strategy and forward-looking innovative use of information technologies, the Telia business units were early developers of Web sites to provide customer access to information and services. Initially, customer-focused Web sites were put into operation at the business unit levels for specific customer groups, an approach that led to (1) a very large number of semi-autonomous Telia-related Web sites and (2) a lack of enterprise standards for Web design, navigation and security.

Recognizing the need for Web consolidation and standardization, Telia embarked in 1998 on an IT and Innovation project to provide a single Telia Web portal with single sign-on and a range of personalized customer services across all business areas. The project, called eFocus, led to the selection of the Entrust's getAccess secure portal software along with leading technology products and services from other suppliers such as Broadvision, Oracle, Andersen Consulting and Sun Microsystems. This case study report describes the eFocus project and the contributions to that project made by Entrust and other strategic suppliers.

The Previous Telia Web Access Environment

Why was the eFocus project initiated? It became evident in 1998 that individual business operations, anxious to meet the needs of customers, moved too fast and independently in setting up their Web sites. The Web initiatives within Telia were highly fragmented, leading to confusion among customers using multiple Telia services. This confusion, along with the diverse Web home page designs carrying the Telia name presented the risk of weakening the Telia brand.

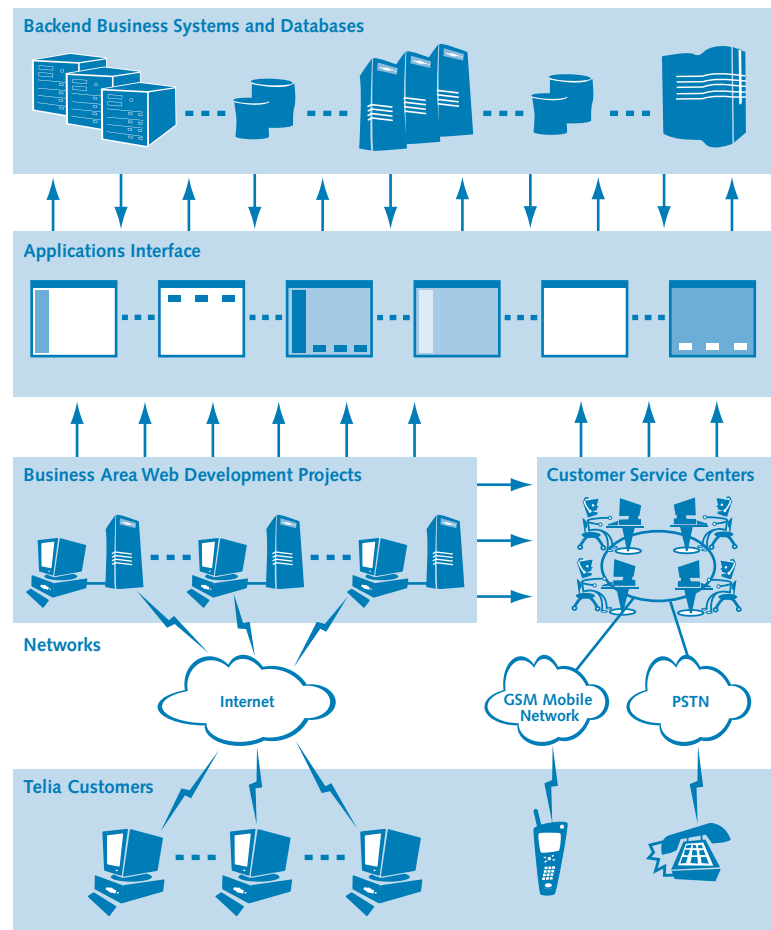
- There were 110 different Web site initiatives within Telia
- Approximately 60 Web sites were operational with differing design approaches to layout and navigation
- There was a low level of Web maturity, most sites offered limited publishing and marketing capabilities.
- Customer interaction for service functions was very limited.
- The overall site structures were unclear, with limited integration to support navigation across customer service areas. Development activities proceeded independently from one another and interfaces to business systems and customer service functions were unnecessarily overlapped and duplicated.

Figure 1 provides a graphic overview of the prevailing Web development and operation environment within Telia when the eFocus project was initiated.

The eFocus Requirements for a New Secure Web Portal Solution

The eFocus project was established in mid-1998 based on guidelines from a Project Steering Group chaired by Jan Rudberg, Telia Executive Vice President and Head of the People Solutions Business Area. The long term goal was to establish a single Telia customer service portal, www.telia.se, for all Internet access to all business areas for all customers and prospective customers. Jan Fredriksson was selected as Project Leader and given the following project objective:

The objective is for www.telia.se to be the natural choice of channel for Telia's business areas for their business on the Internet.



Problems:

1. Customer confusion due to multiple and inconsistent Web access points for Internet users
2. Inconsistencies in design and navigation approaches in different Web development projects
3. Multiple and differing security mechanisms for Internet customers
4. Costly overlaps and redundancies in Web development projects
5. Lack of a common Telia brand across multiple Web sites

Figure 1: Previous Telia Web Development and Deployment Environment

Four specific eFocus goals were defined:

- **To strengthen customer loyalty**—through service quality and convenience improvements, through a better understanding of customer needs and preferences and by personalized customer interactions
- **To strengthen the Telia brand**—by presenting a common Telia Web profile, creating a common channel for all company products and services and simplifying and integrating Internet-based marketing programs
- **To increase Telia revenues**—through decreased time to market and a simplified Web-based set of eCommerce functions

- **To decrease costs**—through migrating an increased number of customer services to Internet-based self-service, thus decreasing the number of services provided through human intervention, e.g., call center agents

Technical plans and criteria defined by the eFocus project team for realization of the project goals included the following:

- Select a small group of key technology partners to provide and integrate open, scalable and proven hardware and software products to include:
 - Secure portal software from an established supplier with a strong market presence
 - Personalization software for one-to-one marketing services, also from a market leader
 - An industry standard relational database management system (RDBMS)
 - An open, UNIX computing platform with a global market leadership position for network-based computing operations
 - A systems integration services partner with expertise in telecommunications, Internet-based service solutions and eCommerce business functions
- In coordination with the selected technology partners, plan and implement an architecture and total solution design that provides all required functionality and also provides reliability, flexibility, scalability and high performance.
- Existence of support not only for traditional Web site access from PCs with modems and browsers via the Internet, but also for the growing number of WAP-enabled mobile phones and other handheld devices connected to GSM wireless networks.
- Implementation of a robust set of security mechanisms through authentication, authorization, privacy, integrity and transaction non-repudiation for both Telia customers and business units.

The Selection of getAccess as the Secure Portal Software

The first major decision made by the eFocus project team was the selection of a technology supplier to provide the most critical solution component, the secure portal software and the related services for customization and implementation of that software. Following a rigorous evaluation of alternatives, Telia chose the getAccess product from Entrust.

Key reasons for Telia's selection of the getAccess solution include:

- The getAccess software functionality matched closely with the eFocus requirements. As one critical example, it offers a true single sign-on feature that allows users to log on just once to access a personalized navigational menu to all information and interactive functions for which the user is authorized. This was an important requirement for the consolidation of the 60-plus Telia Web sites offering customer service support to customers.
- The getAccess security system provides fine-grained user authentication and authorization:
 - It supports the widest range of authentication mechanisms including passwords, tokens, digital certificates, smart cards and various biometrics devices.
 - The getAccess authorization engines are highly flexible and work with the leading LDAP directories, including those from Netscape, Novell and various database management products.
- The getAccess software offers a highly scalable architecture that fits well with the very high growth rates for Telia's eCommerce business initiatives. It is capable of supporting millions of diverse users and has the flexibility to integrate easily with new or existing applications, including the third party content management and personalization software planned by the eFocus team for www.telia.se.
- Telia's evaluation confirmed that the getAccess single sign-on feature offered very high performance, avoiding throughput bottlenecks for users signing on during peak traffic periods.
- Entrust's strengths and commitments in wireless technology were additional positive factors in the evaluation process. The Entrust commitment to the support of secure and individualized access to Internet Web sites from WAP-enabled wireless devices such as mobile telephones and personal digital assistants (PDAs) matched well with Telia's mobile strategies for the future.
- During the evaluation period, it became evident to the eFocus team that the Entrust organization offered an excellent professional services group capable of quickly implementing and integrating the getAccess solution. This was critical for Telia's quick-to-market goal for the new portal.

- It was also considered a very positive evaluation factor that Entrust had close technical alliances with other key suppliers being considered by Telia for the eFocus project, including Oracle Corporation, Broadvision and Sun Microsystems.

According to the eFocus project leader, Jan M. Fredriksson, *“We determined during the evaluation period that the getAccess solution is a powerful and secure portal infrastructure. We were confident it would help us to quickly consolidate access to the many Telia customer service Web sites—and to provide an excellent administrative framework for the management of secure and personalized access by our growing number of Internet-based customers. We also were very impressed with the quality of their personnel, it was clear to us that they not only had a high level of expertise in Web portals but also had a thorough knowledge of the telecommunications industry and understood our business requirements. It was an important decision for us and we can now look back and say that we made the right decision—the Entrust organization, the getAccess staff and the professional services staff have all lived up to all of our expectations.”*

Other Components for the Telia Web Portal Solution

In parallel with the selection of the getAccess secure portal software, the Telia team made final their choices for the other suppliers for key solution components:

- **Broadvision, Inc.** Broadvision's One-to-One software for content management and personalization was chosen by Telia to work with the getAccess secure portal infrastructure to meet project requirements for online delivery of personalized account information to Telia customers. Broadvision's retail eCommerce software also was selected by Telia to provide online shopping capabilities. Broadvision's global leadership position in eCommerce software applications was a key factor in its selection by Telia's eFocus team.
- **Oracle Corporation.** Oracle, the worldwide leading supplier of relational database management software, was selected by Telia to provide the database software for the www.telia.se project. Oracle was already widely used within Telia and was regarded by the eFocus team as the best choice for the new portal project.

- **Sun Microsystems Inc.** Sun Microsystems, Inc. was selected by Telia to be the supplier of the computing platform for the eFocus portal project. Sun Enterprise servers with the Solaris Operating Environment, Telia's preferred version of UNIX, were chosen for the Web, applications and database tiers of the new solution. Two key reasons for Sun's selection were cited by Telia executives:

- The Sun computing platform was already installed for other Telia systems and the company, products and service organization were held in high regard by Telia technical specialists.
- Sun had existing close technical alliances with Entrust as well as with Oracle, Broadvision and Andersen Consulting, the other key members of the eFocus implementation team.

- **Andersen Consulting.** Andersen Consulting, a global leader in consultancy and system integration services for eCommerce solutions, was selected by Telia to work with the eFocus project team and the four key technology suppliers (Entrust, Sun, Oracle and Broadvision) for the development, integration and deployment of the new Web portal solution. A technology alliance between Andersen Consulting and Entrust was a positive consideration in the selection.

With the naming of these four technology providers to complete the team for the eFocus project realization, Telia was prepared for rapid development and implementation of the Telia.se Web portal. Jan Fredriksson, eFocus project leader, offered the following comment regarding the strength of the overall technical team, *“A key factor in our selection of the technology suppliers for www.telia.se was their willingness to work with us and with one another to meet our project goals under a tight schedule. All five lived up to their commitments. Within a four-month time period, we had an initial operational system that proved to us and to the Telia Steering Group that our eFocus project goals were realistic and would be met. We are extremely satisfied with the products and services from Entrust, Sun, Oracle, Broadvision and Andersen Consulting as well as their teamwork on our project.”*

The New Telia.se Computing Environment

The eFocus project was designed, developed, integrated and deployed during the period from 3rd Quarter 1998 to June 1999. By October 1998, the basic solution was developed, integrated and subjected to a highly successful limited pilot, called Quick Win. The new www.telia.se customer service portal was launched on 15 June 1999. The project name was changed from eFocus to eTelia at the time of the production launch.

The software from Entrust, Oracle and Broadvision was customized, integrated and tested by a systems integration team comprised of Telia, Entrust and Andersen Consulting specialists working together as a single unit. Entrust specialists with getAccess expertise defined infrastructure requirements, integrated Telia.se portal infrastructure components and made a major contribution to the integration and deployment effort. Installation and integration support also was provided by specialists from Sun Microsystems and Oracle. The team effort, led by the eFocus project group, rapidly developed and deployed an operational system that met all project goals.

Key customer service functions provided by the www.telia.se solution include:

- **Single sign-on:** Telia customers are able to access any Telia customer service function by signing on once at the www.telia.se Web site. Single sign-on provides security support for the full range of customer service functions available to each customer.
- **Personalized and secured account access:** This key function supports secure online viewing of customer's account information (across multiple accounts) in a format personalized for each customer.
- **Online service provisioning:** Customers are allowed to select or make online changes to their current service mix, e.g., 2nd line installation, call waiting, number change, etc. This service also supports the reporting of service problems and can check on pending service orders or scheduled repairs.
- **Online bill presentation and payment:** This service allows customers to view detailed telephone account information and pay bills online.
- **Online shopping:** This enables customers to view and purchase a variety of Telia products and services through secure Web site interaction. The Broadvision retail eCommerce shopping engine drives the online shopping service.

- **Unified messaging:** This service provides an easy-to-use yet technologically sophisticated messaging system that supports the routing of all messages to a single message box for on-call customer retrieval, including voice mail, e-mail, pager and telefax messages.

Other online services available to customers through www.telia.se include:

- Site-wide search engine, including support for searches of comprehensive Telia white and yellow page directories
- E-mail services, including Address Book update service for yellow and white page selections
- iCall, a Telia voice over Internet phone service
- Personalized content distribution of news, special offers and customer-unique service suggestions

A graphic overview of the Telia.se computing environment is shown in Figure 2.

Current Status and Future Outlook

The new Telia.se Web portal was a success from the beginning and Internet visitor rates rose dramatically following the production release of the new Telia.se customer service in June 1999. Customers quickly accepted the new front-end as a convenient, secure and easy-to-use solution for interaction with Telia via the Internet. The single sign-on and secure personalization features provided by the getAccess portal software were especially welcome by Telia customers.

The high level of success of the eFocus project and the new www.telia.se Web portal is confirmed by the following:

- The Telia site reaches 17% of Internet users in Sweden.
- Telia.se is one of the top 5 brands of the Swedish Web population.
- Telia.se was one of the nominees for the 2000 Computerworld Smithsonian Award.
- Telia.se received the Oracle star2000 eBusiness Award in 2000.
- During 2000, there were over 700,000 unique visitors per month to the Telia.se Web site.

The Telia.se customer service Web site will continue to expand in terms of functionality and service features as well as in the size of its customer base—which is projected to reach five million in the next few years. As one example of future plans for new functionality, the service will soon be extended to WAP-enabled mobile phones and handheld devices such as personal digital assistants (PDAs) connected

to GSM wireless networks. The leading roles of Telia, Entrust and Sun Microsystems in the development and deployment of WAP-based solutions for mobile data services plays an important role in this expansion.

Business Benefits of Entrust's getAccess Portal Solution

Telia's eFocus project, now the eTelia program, has fulfilled the business and technical criteria defined by Telia when the project was initiated in June 1998. Key benefits realized by Telia and its customers include:

- Telia.se has contributed significant gains to Telia's financial results: revenues have increased and operating expenses have decreased.
- Telia.se is recognized as one of the top 5 Web brands in Sweden and has received international recognition. For example, it won the Oracle star2000 eBusiness Award and was nominated for the prestigious 2000 Computerworld Smithsonian Award.
- Customer service quality and convenience for Telia's Internet customers have improved significantly while costs have dropped. There has been a major reduction in call center agent operations concurrent with an increase in Internet-based delivery of customer services.
- The number of Telia.se unique visitors, now over 700,000 per month, is continuing to grow rapidly. The number of registered users is projected to exceed five million with the next few years.
- The breadth of www.telia.se services, features and functions has had a positive impact on both fixed line and mobile telephony services businesses. The ability of customers to view account relationships and billing details online and also to activate or de-activate specific telephony services has contributed to telephony business growth.

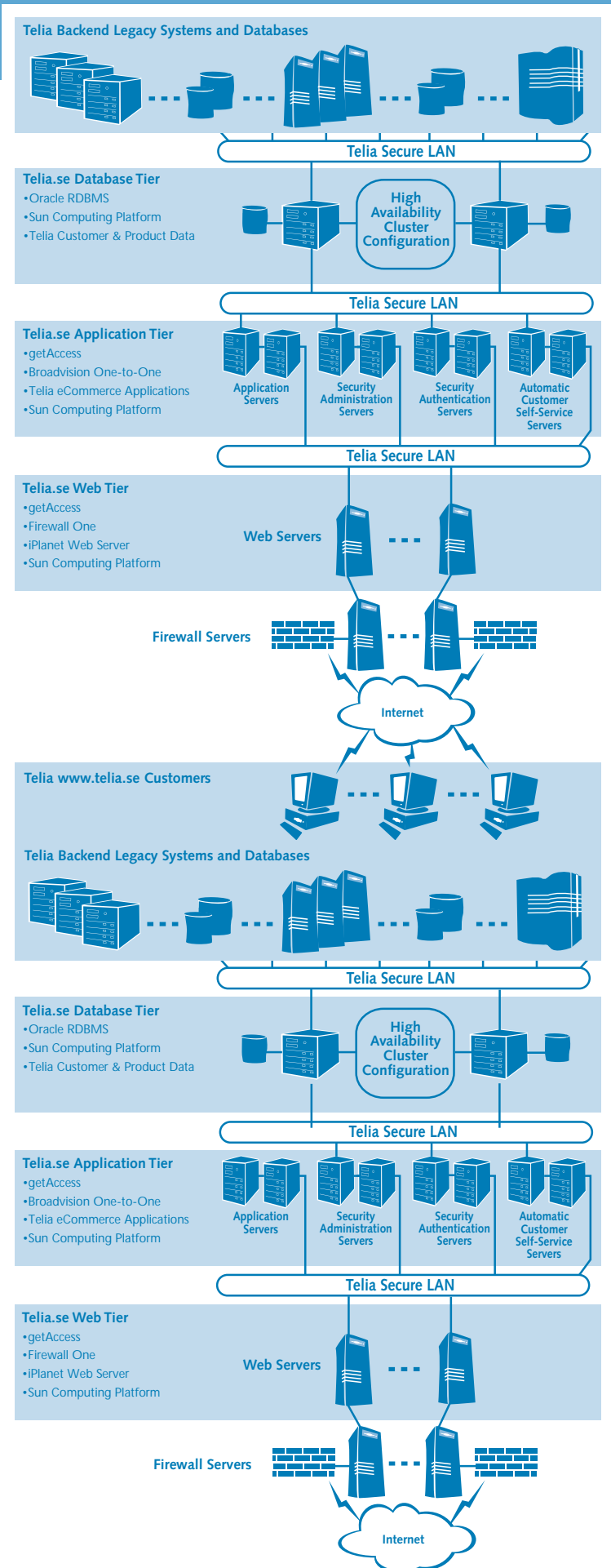


Figure 2: Overview of the Current Telia.se Computing Environment

- The open, scalable Telia.se platform, comprised of technology products and services from Entrust, Sun Microsystems, Oracle, Broadvision and Andersen Consulting, is a solid and proven foundation that will sustain expansion and growth for the next several years.
- The highly talented eTelia project team is a major asset that will keep Telia at the forefront of Internet-based solutions in one of the world's most active and advanced markets for Web-based services.

Concluding Observations

In mid-1998, Telia was faced with the urgent need to consolidate customer access to a large number of Web sites that had been developed and deployed at the Telia business unit level. The task led to the formation of the Telia eFocus project and development of the www.telia.se Web solution built around the getAccess secure portal software solution and integrated with database and personalization software from Oracle and Broadvision to run on a Sun Solaris computing platform.

The Telia.se portal went into production operations for all Telia Internet customers in June 1999 and has continued to expand and grow at a very rapid rate since its initial launch. Telia and its customers are highly satisfied with the results and to the continuing addition of new services under development throughout the Telia organization. Telia's Jan Rudberg offered the following observation on Telia's satisfaction with the roles played by Entrust and other key suppliers in the success of www.telia.se. *"The getAccess solution and the cooperation between Entrust, Broadvision, Oracle, Sun and Andersen consulting were instrumental in helping us deliver the new Telia.se services to our customers. In the increasingly competitive telecommunications market, the www.telia.se customer service portal is a direct response to our customers' demands for increased Web self-service and direct insight into the status of their payments, service orders and other Telia products and services. We could not have met our goals without the excellent support and services from Entrust and our other technology providers."*

Contact Entrust today.

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