



Architecture and Security

For IT Professionals



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Introduction to GERBERconnect

This document describes the architecture and security features of GERBERconnect. It is intended to help you understand how GERBERconnect operates within your environment and how it meets your technical security requirements. It is also intended to address questions about key issues such as communication through firewalls and network security

GERBERconnect Architecture

GERBERconnect operates on Microsoft Windows Vista and XP.

Three components include:

1. A Software Program which is installed on your system.
2. A GERBERconnect data center which resides at a secure location.
3. A Web Portal which allows Gerber Service Professionals access to your system.

GERBERconnect is based on a distributed architecture with software intelligence at all levels. GERBERconnect is designed specifically to exchange data between the Enterprise server and Gerber systems at the local level. GERBERconnect communicates with the system and processes the information received. This prevents having to send information across the Internet for processing, thus, reducing the amount of communication bandwidth required and allowing the system to operate even if the Internet connection is not available. Once back online, the system will resume communication.

The GERBERconnect Enterprise server provides central distribution and processing capabilities for the information flowing through the system. As information is received, it is sent through an event detection and notification process, which is then stored in a

database. The GERBERconnect Enterprise server also manages all security access and data exchange with other applications. Above the GERBERconnect Enterprise server lays a series of applications that present information needed for different types of users. GERBERconnect applications provide the complete user interface for the system. All access is through standard web browsers, enabling system users to access the information they need from anywhere in the world.

GERBERconnect Enterprise Server

The GERBERconnect Enterprise server provides a secure, fault-tolerant infrastructure for communicating and managing the information exchange between systems and businesses and acts as a system data center, storing and managing live and historical information in a secure environment. Business rules drive automated internal processes. As Gerber Service applies the benefits of remote support to larger populations of deployed systems, GERBERconnect Enterprise servers can be clustered to meet scalability requirements.

Deploying GERBERconnect across multiple servers not only increases scalability, it makes the system fault-tolerant through redundancy and fail-over between servers. Clustering is implemented using standard “n-tier” web architecture. Users and systems connect to GERBERconnect via a group of web servers, load-balanced based on the incoming traffic flow.

At the application layer, multiple servers are added as needed to handle business logic processing demands. Likewise, at the database layer, additional servers can be added as the information flow increases. By allowing the addition of processing power at any level in the architecture, the GERBERconnect Enterprise server can be tuned to scale based both on the number of users accessing applications, and the number of systems being monitored.

Firewall-Friendly Communication

GERBERconnect's Firewall-Friendly™ technology provides two-way communication based on Web Services standards including Hypertext Transfer Protocol (HTTP), Simple Object Access Protocol (SOAP), and Extensible Markup Language (XML). No changes are needed to the IT security infrastructure for the customer to support remote monitoring and diagnostics.

In addition, all communication between the data center and the customer site is encrypted using Secure Sockets Layer (SSL) up to 168 bit. GERBERconnect employs widely supported, firewall-compatible Internet protocols and standards such as TCP/IP, HTTP and SMTP to communicate over the Internet. Web-architected browser interfaces are based on industry standard Java and HTML.

The GERBERconnect Enterprise server is built on powerful and portable J2EE (Java 2 Enterprise Edition) application server technology and standard relational database solutions. Graphics, data interchange and file formats at the system, browser, and enterprise levels are based on XML. XML has enjoyed widespread adoption because of its simplicity, portability and self-describing nature. GERBERconnect supports interactions through XML-based standards such as Simple Object Access Protocol (SOAP), a standard for encoding remote API calls in XML that can be transferred through HTTP.

As an open platform, GERBERconnect can tie directly to the system's API's or, alternatively, can utilize standard data protocols such as OPC (OLE for Process Control) or SNMP (Simple Network Management Protocol). Use of standards makes GERBERconnect very portable at both the embedded and enterprise levels.

Maintaining Network Security Integrity

GERBERconnect overcomes firewall constraints with patented Firewall-Friendly™ communication technology that lets systems exchange information securely with enterprise servers—even when systems are hidden behind corporate firewalls.

With GERBERconnect, the system initiates all communications with an enterprise server located at a globally visible address. This enables systems to be deployed in many different locations without requiring modification of security settings within the local network environment.

In simpler terms, if a Web browser can access the Internet using a network connection, the GERBERconnect-enabled system can perform two-way communication with the enterprise server using that same network connection. This method of communication:

- Leverages existing security infrastructure at the system location. The system receives the same network security coverage as all other computers within the facility.
- Simplifies system deployment. The local IT staff does not need to change their existing security configuration. Once connected to the local network, the system is ready to communicate.
- Secures the system from attack. Since the system initiates all communication only to a specified server, and does not have a public IP address, there is little opportunity for an attacker to exploit the communication to access the system.

Ensuring Data Confidentiality

Much of the information that travels across the public Internet uses plain text encapsulated within standard HTTP messages. GERBERconnect solves this security vulnerability by encrypting the message contents sent between the system and the enterprise, so that only the applications at each end can decode them.

GERBERconnect technology uses Secure Sockets Layer (SSL) to provide secure transmission of data. SSL provides a protocol for transmitting private data via the Internet. In addition to encrypting data, the SSL standard also provides authentication to ensure that both the sender and receiver of data are known to each other. SSL supports key length up to 168 bits and mutual authentication using certificates. GERBERconnect can also enable secret key AES 256-bit message encryption, which may be used with SSL to encrypt data beyond the Demilitarized Zone (DMZ).

System to GERBERconnect Enterprise Server

GERBERconnect software at the system initiates all communication with the GERBERconnect Enterprise server. This intelligent software enables the system to act as a Web client and initiates messages to the GERBERconnect Enterprise server that are sent as HTTP POST commands. Each message contains data encoded in XML format and may be sent in plain text (no encryption) or with SSL encryption. For applications that require system authentication and data encryption, GERBERconnect uses SSL.

Future of GERBERconnect

GERBERconnect has been designed to leverage the power of the Internet while ensuring that the data handled by the system is protected. Gerber maintains an active involvement in Internet security matters. As new standards and practices continue to evolve, Gerber will incorporate them into the GERBERconnect service offering.



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