Infor Cloverleaf Integration Suite leads the healthcare industry

Healthcare today runs on increasing quantities of data from new sources and trading partners, crossing business and clinical siloes, with new protocols and standards. Data comes from inside and outside the four walls of hospitals and clinics, from devices and consumers, to AI-enabled tech giants in the cloud.

Cloverleaf connects healthcare

With Cloverleaf, Infor® delivers a complete integration suite renowned for its ease of use, power to handle complex integration, security, and customer proven scalability and reliability. Investment and innovation continues by going beyond legacy HL7 integration, providing solutions to quickly innovate with FHIR, enable Healthcare API Management, aggregate data, and bridge clinical and business data siloes, on premises or in the cloud.

Without fluid exchange of this data, it will be impossible to streamline healthcare, reduce cost, introduce new services, and impact quality. To meet this challenge, integration today needs to be nimble, innovative, secure, and operate reliably at massive scale.

That's why we continue to innovate and invest in Cloverleaf to meet your current and emerging interoperability needs.

## Cloverleaf® offers ease of use, power, and flexibility

Easy to Use

Healthcare integration and development teams need to build connections quickly and confidently. Cloverleaf offers the ability to simplify interface development, speed migrations, maximize reusability, and connect remotely with ease.

- **Browser-based GUI wizards**. These wizards simplify creation and deployment of connections, and let you delegate work across a broader, less technical team.

- **Simplify migration**. With the Buildable Object Xchange (BOX) migration utility, your team can package custom or standard interfaces and components, so that you don't have to develop new interfaces from scratch, supporting best practice design and simplifying migrations. You also can reduce redundancy and errors, easily deploy new interfaces quickly, and collaborate and share your BOXed interfaces with other users with migration wizards.

- **Simplify documentation**. Automated site documentation enables you to easily capture your Infor Cloverleaf site configurations in a graphical site map and human-readable backup blueprint, which you can use for documenting and managing your integration environment.

- **Custom code extensibility**. Cloverleaf provides extreme flexibility with support for a variety of scripting languages. Connect to other systems and expand the capabilities of Cloverleaf using Python, JavaScript, Java and Tcl.

- **Easy database connectivity**. The database connection GUI enables you to explore and import database schemas, build direct connections and SQL statements or execute stored procedures to JDBC-compliant databases with no need for scripting.

- **Network configuration route view**. Quickly resolve issues with a single-message route view that includes inbound and outbound protocols and translations.

- **Simplify translation development**. The translation debugger provides an interactive step-through debugger to enable rapid development and testing of translations. It also supports breakpoints, examination and modification of input and output fields, and allows you to see the output message as it's being built.

- **Easy web services connectivity**. Quickly create connections via new web-service protocols with the Web Services Adapter. Build web services using out-of-the-box support for WS-security, RESTful and SOAP consumer and provider, and WSDL creation and parsing. The Web Services Adapter also allows consumption of RESTful APIs and provides a more efficient, faster means of sending information over the Internet to support systems located outside your organization.

Cloverleaf Wizard
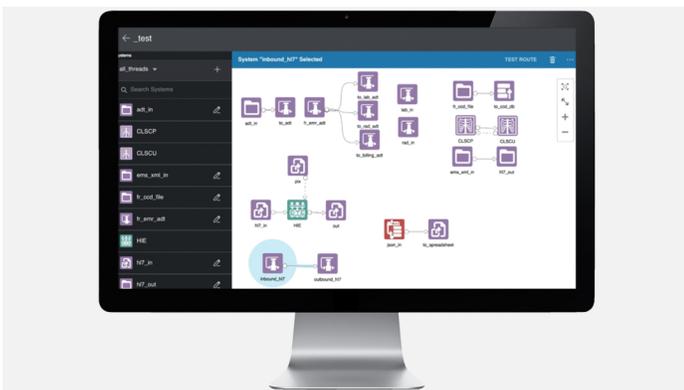
Cloverleaf supports healthcare data standards

Communication protocols and data models

- Web services (RESTful/SOAP)
- FHIR
- JSON
- XML
- TCP/IP—encapsulated and length-encoded
- HL7 (v2 & v3)
- X12
- NCPDP
- EDIFACT
- Secure protocols (TLS, sFTP, FTPs)
- Database (Oracle, SQL Server and more)
- Java
- File, Fileset FTP/Local
- HTTP Client
- DICOM SCU and SCP
- PDL Async
- PDL TCP/IP
- WebSphere MQ
- UPoC (User-written scripts)
- Fixed Record Length (FRL)
- Variable Record Length (VRL, e.g. CSV)
- Hierarchical Record Layout (HRL, e.g. UB04/UB92)
- Length Delimited (LDL)
- HPRIM
- LU3
- LU 6.2 APPC
- LU 6.2 PPCF

- **Simplify remote connections**. With Infor Secure Courier, you can make and manage secure remote connections, all from a central console, without a VPN or need for technical assistance at a trading partner site. Deploy this lightweight agent across multiple clients to allow sending and receiving data via a centralized server. Use Cloverleaf Secure Courier to extend the Infor Cloverleaf Integration Suite across the Internet into remote networks, providing a data-agnostic and secure means of transmitting any healthcare data to your physician community or other entities—particularly those with limited IT resources.

Power for complex integration

With Cloverleaf, you are not confined in a simple GUI, but can roll up your sleeves and get under the hood.

Power users appreciate Cloverleaf's power tooling:

- **Powerful Integrated Development Environment (IDE)** provides the "workbench" for complex integration. Allows users to create re-usable interface object "building blocks," which can be combined in multiple ways to tackle both simple and complex integration scenarios.

- **Command line** access and tooling for command line development and automation.

- **Extensible scripting** is enabled through user points of control (UPoC) at multiple access points to manage message content and flow. Supports multiple languages: Java, Python, JavaScript, and Tcl.

- **Concurrent processing and orchestration** with Distributed Transaction Controller allows creation of a multistage transaction in Cloverleaf, which provides powerful orchestration of asynchronous messages and events. Transactions are backed in a database with full error handling and rollback capabilities.

- **Remote administration API** with secure remote access to Cloverleaf configurations and functions via a RESTful API allows users to automate functions of Cloverleaf using standard API calls, as well as consumption of configuration objects and transaction data by API consumers.

- **Easy to monitor and manage**. Know you are in control, spread the load, anticipate and react quickly to problems.

- **Infor Cloverleaf Global Monitor**. Provides proactive, browser and mobile based monitoring and alerting for your Infor Cloverleaf environment, along with Global Monitor's message tracing functionality. Use widgets to create customized views and dashboards for reviewing the

Global Monitor mobile
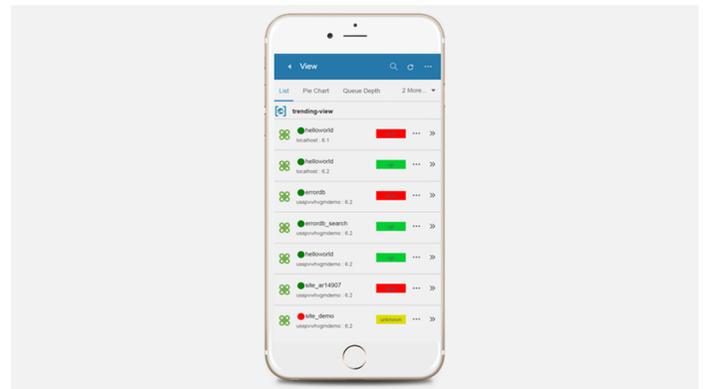
statistics of your Infor Cloverleaf Integration Suite environment and customizable, graphical statistical reports on Cloverleaf activity, including application and system-level statistics. Deploy these views to departmental users to enable them and free up valuable resources. With iPhone and Android app functionality, your IT staff can have monitoring access 24x7 while on the go.

Security

Securely developed with the watchful eye of Infor Security Office, responsible for Infor security globally, Cloverleaf is designed to help you meet the highest security expectations.

- **Hardened** with thousands of incremental security enhancements, exhaustive testing including source code scanning, penetration testing, and vulnerability testing for every release. Software is not released without passing strict security testing.

- **Secure Messenger** provides security by protecting messages throughout the transmission process. Create a secure connection with any other secure-enabled endpoint, such as a web server, FTP server, or TLS socket.

- **Security Server** manages security at the user interface level and locks down access to the application using a granular access control list, based upon role and authentication privileges. Use Security Server to provide continuous control and audit user access to minimize unwarranted Infor Cloverleaf Integration Suite configuration changes and activity. Encrypted security server audit logs can be exported to a readable clear text format for use with third party SIEM monitoring systems to detect security risks.

Cloud

Infor is a global "cloud first" company and supports thousands of customers in Infor Labs AWS Cloud.

Cloverleaf Cloud lets you move fast. Infor plans to provide a managed Cloverleaf service in the Infor Labs AWS Cloud, delivering rapid best practice deployment and configuration, tremendous scalability and availability, 24X7 monitoring and dedicated support, all with freedom from capital expenditure, on-premise infrastructure requirements, implementation delays, downtime, and headaches.

Cloverleaf can also be deployed in a third-party cloud setting with Infor providing services packages covering design, initial deployment, and implementation services.

Data aggregation

Cloverleaf Consolidator efficiently aggregates and standardizes key clinical data across multiple systems through HL7v2 and CCD and makes that comprehensive data accessible via CCD or FHIR and in a data mart for analytics. Consolidator is a standalone solution and works as a complement to any integration platform.

FHIR innovation

Everybody *talks* about support for FHIR®[1]. Infor Cloverleaf has led some of the industry's first large-scale, real-world FHIR implementations and has remained a leader in providing support for FHIR innovation.

Cloverleaf Integration Services 19.1 features support for FHIR DSTU2, STU3, and R4 for developing FHIR-based web APIs on top of existing proprietary APIs or to enhance traditional interoperability paradigms, such as EDI messaging or direct database connectivity, through format and protocol translations.

Accelerate your FHIR-based innovation, and minimize the variance and complexity of your FHIR connectivity.

Infor FHIR Bridge is a prebuilt and extensible solution that simplifies connecting legacy applications to the innovative FHIR application ecosystem through a growing library of bi-directional translations between FHIR and HL7v2. FHIR Bridge offers support for DSTU2 and STU3, orchestration and bundles, and includes monitoring. FHIR Bridge is a standalone solution and works as a complement to any integration platform.

API innovation

APIs are the next frontier in healthcare interoperability, and it's wild out there. The industry is awash with digital innovation, fueled by API-driven connectivity, promising easier connections and data fluidity. The challenge however is that APIs are nonetheless interfaces and you need to manage your APIs as your face to the outside world and your "trading partners," just as you manage your legacy interfaces.

Cloverleaf API Gateway, which is powered by Infor OS, delivers a single point of control and visibility for full API management for healthcare APIs with the power of Cloverleaf behind it.

Clinically integrated supply chain and finance

EHR and ERP applications represent healthcare IT's most expensive implementations. To reap maximum value from that investment and realize that value quickly, you need to forge tight clinical integration of your supply chain and finance systems.

Infor Clinical Bridge quickly connects clinical systems, such as Epic© or Cerner© EHRs, to supply chain, point of use and finance systems, unlocking their value.

Infor Clinical Bridge, a managed integration service, quickly establishes secure connectivity among the EHR and business applications, and maintains that connectivity to maximize uptime. This near-real time integration enables you to reduce errors and exceptions, eliminate manual data entry and paperwork, streamline workflow, and reduce supply expense.

Collaboration and community

More than a message board, **Clovertech** is a vibrant community of Cloverleaf users like yourself. Connect with thousands of Cloverleaf users globally to share best practices, ideas and artifacts. Stay abreast of Cloverleaf news pertinent to you in the newly designed Clovertech.

Consulting and implementation services

Whether you need design consultation or complete integration services, Infor Services is there to help. Infor offers a deep bench of implementation consultants with 10 or more years of Cloverleaf experience. Consultation and implementation services range from initial deployment and side-by-side training to fully managed services including:

- Initial implementation fast track
- Migration fast track
- Site evaluation and consultation
- Add-on module implementation services
- Staff augmentation services
- Application management services
- Fully managed hosted services

Training

Infor provides multiple levels of Cloverleaf training from navigation to configuration and integration as well as installation and administration.

Courses are offered in instructor-led virtual classes and in face-to-face instructor-led classes at Infor offices or your location.

Special events such as Infor TechEd provide another way to gain additional training on Cloverleaf and network with senior product experts and managers.

Support

A deep bench of support analysts with more than 15 years of Cloverleaf experience, supporting customers of all sizes, stands ready to assist you and keep you running.

Improve interoperability

The data you need, when and where you need it. Cloverleaf streamlines healthcare, improving clinical and business outcomes. Cloverleaf makes it simpler and faster to build new connections, onboard new customers, migrate interfaces, adopt new standards, manage and secure your integration environment. With Cloverleaf, your team is able to innovate and conquer the most challenging integration problems. And Cloverleaf has customer proven scalability and reliability.

With more than 20 years of experience and thousands of successful implementations across the globe, you'll benefit from the market-leading Infor Cloverleaf Integration Suite's reliability, scalability, and speed of integration.

Proven scalability and reliability

Embraced by the industry's largest health systems, national laboratories, biggest Health Information Exchange, and global device manufacturers, Cloverleaf is proven by customer experience to be second to none.

- Proven, unrivaled scalability, with customers processing more than 300 million messages a day for a single integrated delivery network that manages 70,000+ interfaces

- One customer reports operating for 6 years without unplanned downtime; another customer reports 600 million messages processed monthly without a single lost message

- Ease of use, with power when you need it.

- An integration suite for a third of US healthcare providers with a 98% renewal rate.

- A suite of applications that extends beyond an integration engine.

- Commitment to ongoing investment and innovation.

- A proven partner, for now and in the future.

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1 FHIR® is the registered trademark of HL7 and is used with the permission of HL7.

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