

CASE STUDY

Nightingale Goes Hybrid for Electronic Health Record Management



At a Glance

Industry:
Healthcare Technology

Location:
Canada and United States

Challenge:
Nightingale, a provider of Electronic Health Records (EHR) and Practice Management solutions for healthcare organizations, needed a cost effective way to accelerate expansion in the United States market while expanding their product's feature set to make it compatible with a broader range of end user devices.

Solution:
Nightingale selected CenturyLink for a hybrid solution consisting of cloud hosting and colocation services.

Nightingale publishes Electronic Health Record (EHR) and Practice Management software with the goal of simplifying the way healthcare is managed. The company's technology keeps track of more than 17 million patient records. As Nightingale's business strategy evolved to include expansion into the U.S. market and its product strategy evolved to include many feature enhancements, including mobile compatibility, the company sought a partner for cloud hosting and colocation. They selected CenturyLink in order to take advantage of highly managed, secure data centres that enabled Nightingale to offer customers an alternative to the single point of failure represented by the doctor's physical file folder or on-premises server.

Challenge: Innovation, Scale and Data Sovereignty

Nightingale has been providing Electronic Health Record (EHR) and practice management software to medical practices and clinics in the U.S. and Canada since 2002. Their EHR Software-as-a-Service (EHR SaaS) suite offers healthcare providers medical records, appointment scheduling and medical billing capabilities. Nightingale's goal is to "Uncomplicate the day-to-day challenges of healthcare providers by creating software that is truly intuitive — minimizing training and maximizing adoption." It's working. The company has experienced strong growth, serving over 20,000 medical practitioner users and handling more than 17 million patient records, 3.3 million prescriptions per year, and 5.2 million insurance claims worth \$1.5 billion on an annual basis.

As the company evolves, its management seeks to increase its customer base, territories, and service offerings. In addition to expanding further into the U.S. market, the company has completed a two-year, \$15 million dollar redesign of its product that culminated in the release of Version 10 (v10) of the Nightingale solution. Nightingale undertook the redesign to replace its current, aging software.

One of the main goals of the redesign was to make the application function on new devices and platforms favored by medical practitioners. The original application had been built on a proprietary platform that was not easily adaptable. Nightingale also wanted a straightforward way to connect to third-party devices, such as blood pressure monitors, that are integral to healthcare practice. “We needed a platform that we could readily add capability to, and that would have an API that other devices could connect with,” said Ijaaz Ullah, Nightingale’s VP, information technology and privacy officer.

The development of v10 also allowed Nightingale to address several IT management challenges that were affecting its overall business. The company had been hosting its commercial EHR SaaS applications and internal business systems on-premises. This caused two difficulties. The process of managing IT was manual and inefficient. Scaling up infrastructure to meet demand was time-consuming and costly. The issue became more urgent as growth accelerated. Nightingale wanted to liberate IT staff from hands-on management of systems to participate in the strategic redesign of the application and service delivery. While the company wanted to increase its market presence in the U.S., their existing approach to application hosting did not meet the data sovereignty requirements needed to operate there. The U.S. and Canada have different healthcare IT regulatory environments. The American Health Insurance Portability and Accountability Act (HIPAA) and Canadian Personal Information Protection and Electronic Documents Act (PIPEDA) each mandate that patient data be stored in the country of origin: Canadian healthcare data has to be housed in Canada while U.S. data needs to be kept in the U.S.

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Solution: Redesign, Replatforming and Cloud Deployment

After reviewing many different options, the Nightingale team decided to create v10 using Java running on Linux servers with a PostgreSQL database. They felt, based on their unique criteria, that the stack would accelerate development and the addition of new features – specifically new scaling, modification, and responsive user interface requirements. It also provided a pretext to make a change and adopt agile development methodologies.

Nightingale sought a cloud hosting and colocation provider to solve its IT management, scaling, and data sovereignty challenges. They knew they wanted to entrust their IT infrastructure needs to a provider with presences in multiple jurisdictions. CenturyLink emerged as the best candidate, with more than 60 global data centre sites and highly automated platform management tools. CenturyLink fit Nightingale’s

requirements for high availability, scalability, and ease of management. CenturyLink provided Nightingale the flexibility to integrate their colocation and cloud requirements through one provider. The integrated solutions give Nightingale the confidence to react to changes and ensure the right IT infrastructure is already ready and available as they need it.

With CenturyLink, Nightingale could create an instance of its solution in one site, but then easily replicate it across the globe. CenturyLink hosts v10 in both the U.S. and Canada, including colocation replication and backup within each country. This capability supports Nightingale’s need to comply with regulations covering the storage of personal health information (PHI). CenturyLink’s audited security policies met v10’s compliance requirements for HIPAA and PIPEDA. Additionally, the use of dedicated physical

servers for data management in colocation satisfies the HIPAA compliance requirement for single tenant, secure storage of patient information. “We wanted one platform for multiple systems in multiple geographic regions,” said Ullah. “Whatever we did, the cloud provider would have to grow with us.”

Nightingale deploys v10 at CenturyLink sites in what it calls “pods.” Each pod is a complete set of virtual machines (VMs), database servers, storage, and network elements. This configuration allows v10 to run without any external dependencies. Nightingale has deployed one primary pod in a CenturyLink Cloud facility in Canada and one in another CenturyLink facility in the United States. In addition, Nightingale maintains two secondary pods, one in each country, with data automatically replicated to servers based in CenturyLink Colocation facilities. “All the automation we build into a solution in a data centre in New York,” Ullah explained, “can easily be duplicated in Chicago for backup. So while the code base is identical across data centres, the data is physically located at each site facility.”

CenturyLink’s built-in security features protect v10 on multiple fronts. The cloud platform includes highly-secured web calls and encryption of data in external transit through secure socket layers (SSL).

Nightingale’s instances are logically isolated from all other systems running in CenturyLink’s multi-tenant public cloud infrastructure through secure LANs, an “open to nothing” default security standard, strict sub-account management policies, and VPNs.

At the same time, Nightingale migrated its internal IT systems to CenturyLink’s colocation service. The company had been maintaining its servers on-site in its office. They ported email servers, file servers and storage management to CenturyLink data centres. The move increased the reliability of their core systems while freeing IT staff for more strategic duties. With CenturyLink colocation for data backup and replication in its v10 product, Nightingale has built a hybrid environment of cloud and colocation application.

During the transition process, CenturyLink worked closely with the Nightingale team, providing guidance on system architecture, cloud migration, and deployment. Like its predecessor, v10 was built on top of a VMware virtual architecture, so Nightingale was familiar with the process. Since working in the cloud was new to the Nightingale team, leading to questions and challenges that CenturyLink helped solve along the way. Nightingale credits CenturyLink with being helpful and willing to offer fast, efficient, and scalable solutions to deployment issues.

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Benefits: Flexibility, Scalability, Reliability

Nightingale is now experiencing the benefits of its new cloud-based v10 EHR SaaS solution. They are enjoying the ability to operate cost effectively in multiple regions while maintaining compliance with data sovereignty, a high level of reliability, system availability, and disaster preparedness. Highlights include having a new scalable application and infrastructure that will support millions of secure healthcare records. “We can build a completely new pod environment in a new location in an hour,” said Ullah. “This gives us a whole new level of confidence in our ability to deliver high service levels to our customers.”

Working with CenturyLink allowed Nightingale to take advantage of automation through rapid scale in multiple locations: “We build something once and reuse it multiple times,” Ullah said. The CenturyLink relationship has enabled a reduction in time to market from months to weeks. Overall, the new application and cloud hosting give Nightingale the ability to quickly add features to the application or scale infrastructure. Nightingale has successfully improved its products to better serve its customers.



Outsourcing IT infrastructure with CenturyLink utilizing both cloud and colocation services allowed the company to lower operating costs by reducing the total amount of resource needed to run the entire infrastructure. Ullah noted, “The question for us was, ‘Do we invest half a million to a million in capital to build out a data centre, or do we spend \$100,000 to \$200,000 over a year to build four of them and pay for it as we need?’”

When factoring in the costs and time burdens of equipment maintenance and potential skills gaps, the case for cloud and colocation became even more compelling. “For Nightingale, the priority was on-demand scale, and the ability to make decisions about service delivery in different regions without massive capital investments,” he added.

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Looking Ahead

Nightingale’s v10 will run in parallel with the previous generation application until customers can be migrated to the new solution. V10 is enjoying a successful rollout. Future plans include more advanced implementations on CenturyLink Cloud’s “Blueprint” templates, including developing custom, automated configurations that allow administrators to spin up complex systems quickly

and with minimal manual effort. The team is also exploring the potential to move actual software development to the cloud, a move that could give developers the ability to iterate on new versions more quickly and seamlessly than is currently possible.

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