

## Diagnostic Center Deploys Connected Imaging Performance & Management as Growth Engine

Center for Diagnostic Imaging (CDI) uses Cisco healthcare solution integrated with Acuo Technologies software to send images anywhere, meeting patients' needs.

EXECUTIVE SUMMARY
<p><b>CENTER FOR DIAGNOSTIC IMAGING</b></p> <ul style="list-style-type: none"> <li>• Healthcare</li> <li>• Minneapolis, Minnesota USA</li> <li>• 750 Employees</li> </ul>
<p><b>BUSINESS CHALLENGE</b></p> <ul style="list-style-type: none"> <li>• Fuel business growth by expanding geographic base</li> <li>• Become more efficient by streaming more images cost-effectively</li> <li>• Increasing image volumes, high availability</li> </ul>
<p><b>HEALTHCARE SOLUTION</b></p> <ul style="list-style-type: none"> <li>• Upgrade network infrastructure to improve image availability, access and timeliness</li> <li>• Provide secure, efficient imaging, ensure collaboration, eliminate costs of film storage</li> <li>• Integrated content switches and Acuo software solution optimizes intelligent image routing and achieve greater image availability to larger geographic base and clinicians with various specialties</li> </ul>
<p><b>BUSINESS RESULTS</b></p> <ul style="list-style-type: none"> <li>• Capability to provide imaging services to more than double the number of clinics</li> <li>• Number of images scanned has grown 60% in 2007</li> <li>• Eliminated geography as a barrier to business success</li> </ul>

### Business Challenge

Founded in 1981 by Dr. Kenneth Heithoff, Center for Diagnostic Imaging (CDI) was one of the first freestanding, outpatient imaging providers in the country. CDI is now a national network of imaging providers offering a full range of diagnostic imaging, pain management and interventional radiology services. Being a national provider that is locally focused helps CDI provide each patient with the best of both worlds: individual care and national resources.

That dual focus of national provider and local emphasis defined CDI's business challenge. "As we grew, we needed to ensure that the value are place on consultation between specialists can be handled by our network," says CDI Infrastructure Architect James Keller.

In 2002, CDI embarked on the daunting challenge of upgrading its systems infrastructure to a single radiology information system (RIS) coupled with an open architected Picture Archive and Communication System (PACS) which would allow best-of-class

reading workstations to be deployed. The initial step was to select and implement a RIS which would support this vision. RISLogic was selected and implemented. In 2003, CDI had expanded to 24 centers and decided to select and implement a PACS solution which would provide a vendor-neutral, open environment which would not restrict the use of best-of-class reading and Computer Aided Diagnosis (CAD) solutions. Further, a requirement was to provide an archiving infrastructure which would support the transparent migration of archived images to new storage technology as it became available. To establish an effective PACS infrastructure and image workflow capability for its widely dispersed enterprise, CDI turned to Cisco Systems and its partner, Acuo Technologies.

"We cannot afford downtime, misdirected traffic, or an unwieldy number of servers on our network," says Keller. "We want to read reports and view images online, instantly, anytime anywhere."

## Imaging Solution

CDI first talked to Cisco in part because of Cisco's leadership in Connected Imaging as a strategic initiative. Cisco Connected Imaging solutions facilitate information sharing so clinicians can interpret, diagnose, and collaborate to treat patients. With Cisco Connected Imaging, CDI would be able to:

- Provide secure and efficient image archiving and access
- Improve productivity, support collaboration, and reduce costs throughout the imaging workflow
- Send images securely and quickly across the network to caregivers inside and outside CDI.
- Accelerate reductions of film storage and transport costs and delays

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—Steve Fischer, CIO, Center for Diagnostic Imaging (CDI)

As a national imaging services provider, CDI had to be able to optimize its abilities to acquire, manage and store images across a national imaging archive environment to continue to fuel growth. For that it turned to the Cisco's Connected Imaging solution built in conjunction with Acuo Technologies. The solution utilizes Cisco CSS 11501 Switch integrated with Acuo's DICOM Services Grid to optimize image management and archiving, and PACS performance. Connected Imaging facilitates the secure acquisition and delivery of digital images to PACS. Each imaging center has a local storage cache containing approximately 30-90 days of studies online managed by Acuo's software. The result is more timely and accurate interpretation of images as clinicians and specialists—even in different locations—can share images and diagnoses without worrying about system capacity.

The foundation for Cisco's CSS and Acuo's DICOM Services Grid was Cisco's Medical-Grade Network, specifically its 3800 ISR routers and 3750 switches. The Medical-Grade Network enabled CDI to lower the costs and complexities of its infrastructure environment, while supporting mission-critical imaging services, by providing a highly reliable, available and secure platform. The Medical-Grade Network is a modular and adaptable architecture enabling CDI to align its national expansion plans with its infrastructure deployments.

“The solutions offered by Cisco and Acuo allowed us to deliver more and better services with the minimum number of servers,” says Keller. “As a result, we were able to minimize our hardware expense and serve more patients.”

Perhaps the most important benefit comes from having a communications system that can change and grow at a moment's notice, enabling new capabilities for more effective diagnostic communications, clinician mobility, streamlining business processes, fueling growth, and improving profitability. CDI Network Engineering Manager Jerry Allard sees a strong correlation between the network solution and those benefits. “As we add new partnerships and imaging centers, we can either add to the existing regional facility or create a new regional facility,” he says. “We can do this just by scaling our capacity and performance in conjunction with the number of supported imaging centers.”

“The Cisco and Acuo products have allowed CDI to efficiently grow while minimizing step-function increases in costs associated with moving, storing and managing the digital images critical to our radiologists, referring physicians, and patients,” says CDI Chief Information Officer Steven F. Fischer.

## Business Results

PRODUCT LIST
Cisco Medical-Grade Network Foundation <b>Cisco Connected Imaging Solutions</b> <ul style="list-style-type: none"> <li>• Cisco 11501 Content Services Switch</li> <li>• Cisco 3800 ISR Routers</li> <li>• Cisco 3750 Switches</li> </ul> <b>Acuo Technologies® DICOM Services Grid™</b> <ul style="list-style-type: none"> <li>• AcuoMed Enterprise DICOM Services Grid—v 5.0</li> </ul>

“The demonstrated success of our image management infrastructure has allowed us to offer high quality consultations by more physicians for more patients than ever before,” says Andrew Pipp, CDI’s Director of IT.

When CDI began work with Acuo in 2002 it had 15 clinics. Today, it has 42. In 2002, CDI-affiliated physicians read 189,000 exams representing 24 million digital images; they will read 287,000 exams

representing 38 million digital images by the end of 2007. This growth has required CDI to establish a distributed PACS network, with Cisco and Acuo at its foundation. When the company opened its doors in 1981, it had one center in Minnesota, now its centers are spread from Florida to Washington.

“Critical to CDI is our ability to increase access to excellent care and services by providing concise, specialized clinical information to referring physicians – which includes obtaining the expert advice of sub-specialists located anywhere on the CDI PACS network through the use of advanced technology,” says Fischer. “For example, an extremity radiologist reads only extremity exams and is an expert in their interpretation. Additionally, through our peer review program, geographically dispersed sub-specialized radiologists can review cases and compare notes thereby continually improving reads and refining the scanning protocols to obtain the best results.”

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—Andrew Pipp, Director of IT, Center for Diagnostic Imaging (CDI)

“We have confidence that our imaging data remains agile and portable as we continue to refresh our enterprise storage infrastructure needs with Acuo and Cisco,” says Fischer. “We feel we are empowered with freedom of choice and can nimbly take advantage of the latest and lowest cost hardware and storage platforms.”

The solution allows CDI to continue to grow its business while sustaining operational effectiveness across its existing communication networks. The vision from the leadership of CDI has resulted in an award-winning implementation of enterprise PACS for delivering the most cost-effective imaging services and to improve the quality of healthcare by having specialists review complex cases without geography as a barrier.

“The addition of clinics leverages the IT infrastructure, effectively spreading costs over more exams, thereby reducing the cost per exam,” Fischer says. “Consistent delivery of timely, quality results in a cost-effective manner is how recurring business is garnered.”

### For More Information

<http://www.cisco.com/go/healthcare>



**Americas Headquarters**  
Cisco Systems, Inc.  
170 West Tasman Drive  
San Jose, CA 95134-1706  
USA  
[www.cisco.com](http://www.cisco.com)  
Tel: 408 526-4000  
800 553-NETS (6387)  
Fax: 408 527-0883

**Asia Pacific Headquarters**  
Cisco Systems (USA) Pte. Ltd.  
168 Robinson Road  
#28-01 Capital Tower  
Singapore 068912  
[www.cisco.com](http://www.cisco.com)  
Tel: +65 6317 7777  
Fax: +65 6317 7799

**Europe Headquarters**  
Cisco Systems International BV  
Haarlerbergpark  
Haarlerbergweg 13-19  
1101 CH Amsterdam  
The Netherlands  
[www-europe.cisco.com](http://www-europe.cisco.com)  
Tel: +31 0 800 020 0791  
Fax: +31 0 20 357 1100

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