



 Mighty Guides



# HIGHER EDUCATION COMPUTING

## Best Practices for Cloud Migration

Sponsored by: **ellucian.**

# FOREWORD

In 2016, the *New York Times* reported that of all the jobs created in the United States since 2008, 99 percent went to people who had some college experience; 72 percent went to people who had at least a bachelor's degree.

Gallup finds that 70 percent of Americans now consider a college education "very important." In 1979, that figure stood at just 36 percent.

Driving the point home, according to the Bureau of Labor Statistics, the percentage of high school graduates opting for higher education has risen in each of the past three years. Why? A Georgetown University study predicts that 3 million jobs will be left unfilled in 2018 because workers lack the requisite skills.

We are seeing these trends reflected around the world, and despite what we hear about shifting demographics, budget cuts, and the returns on investment students receive, the numbers point to an era in which student success will drive our shared prosperity like never before.

That's why we've asked thought leaders across higher education and the private sector to share their perspectives on how best to seize the opportunities ahead. Recruiting. Retention. Development. Increasing efficiency. Breaking down the information silos that impede informed decision making across the campus. These are just a few of the topics you'll find covered in the pages to follow.

From best practices to peer recommendations to personal experiences, we've tapped into the collaborative spirit of higher education to help you create a modern, connected campus that meets every student, faculty, and staff member's need. We hope this guide is helpful as you lead your institution into the exciting times ahead.



Regards,  
**Jeff Ray**  
President and CEO  
Ellucian

# ellucian®

Ellucian is the worldwide leader of software and services designed for higher education. More than 2,400 institutions in 40 countries rely on Ellucian to help enable the mission of higher education for over 18 million students. Ellucian provides student information systems (SIS), finance and HR, recruiting, retention, analytics and advancement software solutions. With more than 1,400 unique deployments of Ellucian's cloud and SaaS offerings, the company is one of the largest providers of cloud-based solutions. Ellucian also supports the higher education community with a range of professional services, such as application software implementation, training, education, and management consulting. Visit Ellucian at [www.ellucian.com](http://www.ellucian.com)

# INTRODUCTION

These are exciting — and trying — times for higher education. Many institutions face smaller, tighter budgets but feel the pressure to modernize technologies to stay competitive.

Through a generous partnership with Ellucian, we've spoken with 20 institutional leaders and experts to learn more about technology challenges and trends in five key focal areas: student success, cloud computing, analytics, advancement, and talent management.

*We asked four experts the following question about cloud transformation: **Fear of the cloud has lessened and schools are rethinking their IT infrastructure. What advice would you offer a fellow CIO (or IT Director) to get the most out of the cloud to ensure long-term success? What advice would you offer to help mitigate the risks?***

During these discussions, the experts shared success stories about operational efficiency, student and staff engagement, and degree completion. They also recounted lessons learned from the challenges they faced while putting new technologies into place.

One thing they all agree on is that when implemented properly and executed well, technology is a platform on which all postsecondary learning institutions can build success. These professionals also highlighted the need for a holistic view of technology across the institution and a concrete plan for campuswide deployment as essential for success.

I trust you'll find these experts' insights and advice useful and that after reading this book, you'll come away with solid strategies to help advance the use of technology in your college or university.



All the best,  
**David Rogelberg**  
Publisher



**Mighty Guides make you stronger.**

These authoritative and diverse guides provide a full view of a topic. They help you explore, compare, and contrast a variety of viewpoints so that you can determine what will work best for you. Reading a Mighty Guide is kind of like having your own team of experts. Each heartfelt and sincere piece of advice in this guide sits right next to the contributor's name, biography, and links so that you can learn more about their work. This background information gives you the proper context for each expert's independent perspective.

Credible advice from top experts helps you make strong decisions. Strong decisions make you mighty.

# Higher Education Computing

---



**Shelton Waggener**  
Internet2.....5



**Kenneth C. Green**  
Campus Computing.....11

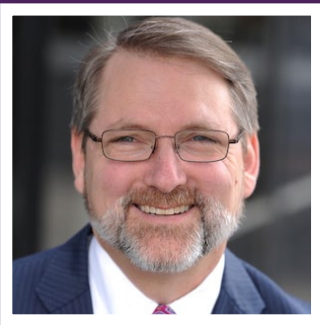


**Tom Dugas**  
Duquesne University.....8



**Bill Thirsk**  
Marist College.....14

# HOW THE CLOUD AIDS HIGHER EDUCATION



## SHELTON WAGGENER

Senior Vice President,  
Internet2

Shelton Waggener is the senior vice president of Internet2, a U.S. national research and education network. A recognized leader in cloud technology, Shelton oversees the Internet2 NET+ cloud services program, which provides community and customized commercial cloud services such as security, infrastructure, platform, software, and research environments to more than 300 U.S. universities. Prior to joining Internet2, Shelton served as associate vice chancellor and CIO of the University of California, Berkeley.



Twitter | Website | LinkedIn



Download the full e-book: [The Future of Higher Education](#)

Those who are making the move to the cloud should treat the shift as a full transition from one technology stack to another, says Shelton Waggener, senior vice president of Internet2. “The difference from on-premises transitions (like mainframe to mini, client server to web server) is that the technology stack isn’t one that you build locally,” he says. “Cloud platforms simply move much faster than any previous technology transition. This migration is accelerating the pressure on chief information officers globally, across all industries, to evaluate their technical platform strategies. You simply cannot avoid being in the cloud, whether you want to or not.”

“Three dimensions, without question, drive higher education CIOs’ need for the cloud. Surprisingly, none of them has to do with cost, which is where many people start and end their thinking about the cloud. While costs are a substantial issue and certainly a consideration worth engaging in and building a strategy around, that isn’t really the most significant driver. Instead, there are three trends around cloud that are the most significant drivers: *mobile-first strategy, big data, and security*,” says Waggener. >>>



Students don't think in terms of constrained environments. Just like they do in the real world, they need to be able to make decisions in real time, all the time.



## KEY LESSONS

- 1 Mobility, big data, and security are the driving forces behind higher education institutions' move to the cloud because they are areas in which cloud apps and vendors excel and can help institutions make considerable improvements.
- 2 Recognize that every institution is already in the cloud by way of their students' cloud access. Therefore, cloud adoption allows institutions to gain useful insight into and control over that access.

# HOW THE CLOUD AIDS HIGHER EDUCATION

“The question of moving to the cloud is driven not by the cloud itself but by its alignment with the mission of higher education as an industry, who we are culturally and practically. We must collaborate to learn, innovate and advance scholarship. We’re geographically diverse across multiple campuses—even within single universities—and across institutions, so the collaboration with each other is critical. Social media and social networking have provided the means for people to stay online and be connected at all times. Everyone is using the cloud daily, removing the question whether you should adopt the cloud or not. In fact, your institution is already adopting the cloud as a primary computing platform. The CIO’s job is to find ways to make your institution’s move to the cloud as simple as it is for people to adopt applications on a smartphone.”

As an example, Waggener points to changes in the way students currently interact with institutions. In the past, colleges designed courses with physical time and space constraints in mind. Today, however, those barriers no longer exist. “Students don’t think in terms of constrained environments. Just like they do in the real world, they need to be able to make decisions in real time, all the time,” he says.

Another essential part of the technology shift, according to Waggener, is big data. “The big data dimension of cloud computing is more than the shift from owning infrastructure: It is now allowing for the ability to handle all the capacities, indexing, and management of the data or the applications environment that optimize your administration.” >>

“  
*I really believe that being in the cloud gives our higher education institutions the opportunity to be more secure than they would be by themselves.*  
”

# HOW THE CLOUD AIDS HIGHER EDUCATION

“Most savvy CIOs have recognized that what matters isn’t the computing power, storage, or even the application but the data itself. And not just the data but the *metadata*—the data about the data. If you think in terms of all the technology activities we do every day, every click on a device, every page view, every consideration of a student or a faculty member is actually a data point to be managed, secured, and privacy protected. That’s the responsibility of the CIO.”

“You need a technology environment that can expand or contract all the data collection and data analytics that take place,” he adds. “If you’re going to build your own data center to accommodate all the possible use cases (particularly for supporting research use cases), you need a lot of land and a lot of electricity. That’s just not a viable path for our resource-constrained universities.”

Finally, security presents a special challenge for institutions not only because of their collaborative nature but also because of the thousands of individuals who come to higher education fully connected through many of their own devices. How do you secure such a wide array of environments? The old days of building central environments and trying to secure them is no longer effective (nor possible given budget constraints). Waggener says that institutions that are avoiding moving anything to the cloud shouldn’t fear security, however. “What we’re seeing is cloud companies whose very survival is based on the security of their customers’ data. They invest a much greater percentage of their resources in security than higher education is able to allocate. By carefully considering options and adding cloud services in the right way, universities are actually adding security. I really believe that being in the cloud gives our higher education institutions the opportunity to be more secure than they would be by themselves.” ■

# TAKE A DIP IN THE CLOUD COMPUTING KNOWLEDGE POOL



**TOM  
DUGAS**

Director of Information  
Security/Special Initiatives,  
Duquesne University

As the director of Information Security/Special Initiatives at Duquesne University, Tom Dugas develops and oversees a comprehensive, unified information cybersecurity program that includes detection, prevention, incident response, and threat awareness. He is also responsible for identity and access management and data governance.



Twitter



Download the full e-book: [The Future of Higher Education](#)

Institutions tend to fall into one of three phases of cloud computing adoption, according to Tom Dugas, director of Information Security and Special Initiatives for Duquesne University.

“The first category is *cloud aware*, where an organization is just thinking about moving to the cloud. The institution knows that the cloud is out there, but it’s not sure what it’s going to do with it or how to get started with cloud adoption. The second is *cloud experimentation*, where the institution starts to focus on one particular service—email, for example—to get to the cloud. The third is *opportunistic cloud*, which is where Duquesne fits. We look at cloud solutions as ‘what is the right opportunity?’ My advice is, figure out where on that ladder your organization thinks it is, and then think about the considerations in each area.”

Dugas says that most colleges and universities fall into the group that is experimenting with the cloud. “What you want to think about is whether somebody has paved the path already. Higher education is rich in collaboration and opportunity, and we can use what a lot of other folks have done before us in cloud adoption without having to reinvent the wheel. Take the path already paved. Use what you can from collaborative efforts.” >>>



Take the path already paved. Use what you can from collaborative efforts.



## KEY LESSONS

- 1 Heed the lessons learned by early adopters before moving to the cloud, including how they have adjusted their security strategies to secure cloud services.
- 2 Expect the way you allocate resources, especially employee resources, to change, but recognize that any savings you experience by implementing cloud services will likely come from other types of changes.



# TAKE A DIP IN THE CLOUD COMPUTING KNOWLEDGE POOL

Despite the collaborative nature of higher education, some institutions still have cloud security concerns. According to Dugas, however, “Going to the cloud doesn’t change your risk strategy: It just helps you focus on different aspects of it.” For example, “The important things to think about in cloud computing risk strategy are identity and access management (IAM). What is the authentication method? What kind of authorization do you use? Can you federate it? Does it work with your existing integration and existing IAM points?”

Dugas says many institutions also worry about their data. He suggests asking questions such as, “What kind of data are you looking to host in the cloud, and how will you secure those data? Are you using single tenant or multitenant? Will your data be spread out across multiple data centers across the United States or even in foreign nations?” He advises, “Don’t be afraid to ask those questions about your data.” He also suggests that new cloud users also look inward, especially when it comes to risk assessment. “Higher education is a really great collaborative area,” says Dugas, “but I think it’s important to conduct an independent risk assessment. Don’t assume that that assessment will turn out the same as the next institution’s.”

Dugas cautions that institutions won’t necessarily need fewer resources. Instead, you may find that you use existing resources differently. “You may add resources or change resource assignments to have more systems analysts, business analysts, and integration experts rather than system administrators, database administrators, and network engineers. You switch it around a bit to focus more on all the key touch points between your cloud systems and your current systems on premise as well as your user community. Moving to the cloud gains you elasticity. It is not always a cost savings, but rather it gives you the ability to allocate resources differently.” These resource allocations often allow for new initiatives that can enhance the competitiveness of the institution or enhance the mission, which directly adds business value. ■

“  
Going to the cloud  
doesn't change your risk  
strategy: It just helps  
you focus on different  
aspects of it.

”



*A cloud-first strategy will help institutions address greater economies of scale, increased agility, and enhanced security while focusing on the core mission of providing faculty, staff, and students with more nimble and innovative services.*



Twitter



Blog



LinkedIn

R. "RAY" WANG

Principal Analyst and Founder, Constellation Research

# PLAN FOR THE TRANSITION TO THE CLOUD



## KENNETH C. GREEN

Founding Director,  
Campus Computing

Kenneth C. Green is the founding director of the [Campus Computing Project](#), which is the largest continuing study of e-learning and information technology in American higher education. Campus Computing is widely cited as a definitive source for data, information, and insight about key IT planning and policy issues that affect U.S. colleges and universities.


 |  |  |  | [Twitter](#) | [Website](#) | [Blog](#) | [LinkedIn](#)



Download the full e-book: [The Future of Higher Education](#)

Like many observers of IT in higher education, Kenneth C. Green, founding director of [the Campus Computing Project](#), views the arrival of mission-critical, cloud-based enterprise resource planning resources and services to be a matter of *when*, not *if*.

“Campus IT leaders recognize that the cloud is inevitable. For example, 83 percent of the participants in the fall 2016 Campus Computing Survey said that cloud computing will play an increasingly important role in their campus ERP strategy. That’s a big number. Campus IT leaders acknowledge that their institution’s impending migration to the cloud is a transition that involves not just technology and data but also people and work processes,” says Green.

Green notes that even though campus IT officers know the cloud is inevitable and view it as beneficial, many institutions aren’t yet rushing to the cloud for key ERP applications. “Our fall 2016 survey data reveal that CIOs and campus IT leaders see the migration to the cloud for key ERP applications to be slow. For example, less than a fourth expect their campus to be running a cloud-based financial or student information system application in five years, by fall 2021.” 



83 percent of the participants in the fall 2016 Campus Computing Survey said that cloud computing will play an increasingly important role in their campus ERP strategy.



## KEY LESSONS

- 1 Educational institutions may feel uncertainty about moving to the cloud, but by waiting, they may be missing out on many of the benefits the cloud has to offer.
- 2 A successful move to the cloud should be preceded by in-depth planning, risk assessments, transition strategies, costing measurements and metrics, and keeping open communication.

# PLAN FOR THE TRANSITION TO THE CLOUD

*Why the slow migration?* More than any other IT market segment, higher education is incredibly risk-averse. Many college and university IT leaders would prefer to see other campuses go first in order to learn from the experience of early adopters.

Moreover, for some campus tech leaders, cloud migration is also a matter of command and control over their IT resources and operations. Some IT officers may feel that their institutions have less control over key ERP applications in the cloud, even though—at least on paper or on a whiteboard—there are obviously significant operational, technical, and perhaps even financial benefits involved in migrating to the cloud for select applications.

There's also some concern about securing mission-critical data in the cloud. "There's a sense on the part of many institutional leaders that they have seen security problems in the cloud elsewhere, in corporate and consumer markets. So not surprisingly, campus IT officers want to know where their data reside and who is watching the data," Green says.

To ensure long-term success with cloud-based applications, Green suggests asking eight questions: "Can we, could we, why should we, what will it cost, when do we, what can others tell us, what don't we know to ask, and how do we assess success?" He also suggests adding one more. "There's sort of a precursor to these questions, and that is, What's the compelling message from my provider, and am I ready for that compelling message? This is really all about what you do in terms of planning, risk assessment, transitions, and understanding costs. Campus officials recognize that despite their best planning efforts they will encounter the inevitable 'known unknowns.' The challenge is having a plan to address these and related issues that emerge during the cloud migration process." >>>

“  
Campus IT leaders  
acknowledge that their  
institution's impending  
migration to the cloud is  
a transition that involves  
not just technology and  
data but also people and  
work processes.  
”

# PLAN FOR THE TRANSITION TO THE CLOUD

One way, of course, is to learn from those who have already made the journey. “It’s important to learn from the experience of others,” Green says. He adds, “Take a deep breath and recognize that this is as much about collaboration and teamwork between provider and user as it is about collaboration and teamwork among the various constituencies on campus that will be responsible for implementation. There are a lot of moving parts, there are a lot of silos, and there will also be a few egos and fiefdoms involved in the transition.”

What’s Green’s strategy for success? “Set modest goals and realistic deadlines, work in teams, build coalitions, anticipate change, and communicate constantly,” he recommends. “Acknowledge the possibility of personnel turnover, because people move.” Finally, colleges and universities must see the value in the cloud and trust their tech providers if campuses are to migrate mission-critical institutional data and services to the cloud, and then reap the benefits that cloud technology can provide. ■

# CAREFULLY CONSIDER CLOUD VENDORS



**BILL  
THIRSK**

**Vice President of Information  
Technology/CIO,  
Marist College**

Bill Thirsk serves as the vice president of Information Technology (IT) and CIO at Marist College in Poughkeepsie, New York, where he oversees all areas of IT. Bill is a recognized expert in higher education technology management, providing his insights to recognized publications such as *The Wall Street Journal* and *CIO Magazine*. Bill also actively serves as board chair of NYSERNet.org and on the board of directors of the Northeast Research and Education Network.

 |  |  |   
Twitter | Website | Blog | LinkedIn



Download the full e-book: [The Future of Higher Education](#)

With more than 30 years of experience in higher education IT management, Bill Thirsk doesn't mince words when it comes to pinpointing why some educational institutions have been slow to adopt cloud-based software technologies. "I'm going to challenge the idea that there's fear of the cloud," he says. "I don't think there's ever been fear of the cloud. It's not fear, it's really a lack of trust for some of the people we do business with."

Thirsk cites examples of companies that have come and gone from the industry or have changed names and direction multiple times over the years and suggests that when a brand-new sales rep from one of these firms shows up in his office looking to establish a long-term trust relationship with a system of consequence, "I can tell you, it's just not going to happen."

"We are a different industry from the others for sure," says Thirsk. "We are much more parochial about what we do because our customers live with us. These students are with us 24x7—when we make purchases that are of consequence, we do it very, very carefully." >>>



*I don't think there's ever been fear of the cloud. It's not fear, it's really a lack of trust for some of the people we do business with.*



## KEY LESSONS

- 1 Cloud vendors must earn an institution's trust by showing that they truly understand the education market and aren't simply the flavor du jour.
- 2 A more modular approach to software solutions can create greater flexibility, but often requires help in the form of integration services.

# CAREFULLY CONSIDER CLOUD VENDORS

Thirsk suggests that colleges and universities must sort various functions into three distinct pillars, and then plan their cloud strategy accordingly:

- **Pillar 1: Systems of Convenience.** First, says Thirsk, are the systems of convenience, like booking travel or expense reports. These systems take a lot of maintenance and require outside relationships, but if they go down or are corrupted, “they’re not going to kill you.”
- **Pillar 2: Systems of Record.** The second pillar consists of systems of record, which may be proprietary to the institution and need a higher level of security and reliable access.
- **Pillar 3: Systems of Consequence.** The third and most critical pillar, says Thirsk, consists of “systems of consequence,” such as financial data and personal information—key sources of insight that provide a competitive edge or systems that, if a data breach occurred, could cost the college or university not only its reputation but also a lot money.

All three tiers require serious consideration, says Thirsk, but he suggests that the systems of consequence place a greater burden on vendors in terms of reputation, reliability, consistency, and compatibility. “We’re extremely careful to go only with high-level, trusted partners for any service provision, particularly those that are cloud-based.” >>>

“  
These students are with us 24x7—when we make purchases that are of consequence, we do it very, very carefully.”

# CAREFULLY CONSIDER CLOUD VENDORS

So, what are the most important considerations for choosing a trusted partner or vendor for cloud-based services?

“The first thing is that they have the right to be in the business,” says Thirsk. “By that I mean that their systems are well architected and not overly complex. A vendor has to earn the right to tell me as a technologist that they know what they’re doing.”

“The second thing to consider is whether the relationships underneath the system are fully disclosed,” says Thirsk. “When you go to most cloud providers, you’re signing for a Software as a Service function, sitting on top of someone else’s Platform as a Service and probably sitting on someone else’s real estate.” It’s critical for the educational institution to fully understand these relationships and what it is really signing up for.

Thirsk admits that some smaller institutions with limited budgets are turning to the cloud to increase their technology scope without having to make a lot of infrastructure improvements. Although he worries that this mindset can lead to unanticipated consequences—companies losing data, going out of business, suffering security breaches—he is encouraged that some vendors are moving to more focused, modular solutions that will give institutions better choices and additional flexibility. The challenge then becomes integration, says Thirsk, something both established vendors and new providers are beginning to address. ■



# READY TO CLEAR YOUR BIGGEST HURDLES?

- Ensure student success ✓ Student lifecycle management
- Make better decisions ✓ Role-based analytics
- Simplify integration ✓ Higher education data model
- Delight users ✓ Mobile and intuitive UX
- Unlock agility ✓ Cloud
- Navigate change ✓ Advisory & managed services

LET'S GET STARTED

ellucian.

[www.ellucian.com/getstarted](http://www.ellucian.com/getstarted)