



North Dakota University System

# Core Technology Services 2019-2020 Annual Report

Report generally covers the period from July 1, 2019 to June 30, 2020





**Dr. Mark Hagerott**  
Chancellor



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Vice Chancellor IT/CIO

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This report was developed in accordance with N.D.C.C. §15-10-44.1.c.

Integration of higher education information technology planning and reporting with the board's strategic planning process and annual performance and accountability report required by section 15-10-14.2.

## NDUS Information Technology Goals:

**Support North Dakota University System infrastructure needs.**

**Improve North Dakota University System information technology-enabled business processes and services while providing and managing resources to align with NDUS strategic goals.**

**Improve and enhance North Dakota University System student learning and user's focus.**

**Improve and enhance North Dakota University System collaborative efforts.**

The mission of Core Technology Services (CTS) is to deliver technology- based resources, services, and solutions to NDUS students, faculty, staff, institutions, System Office, and North Dakota residents.

CTS does this by leveraging current technologies, researching new technologies, and positioning the University System to innovate and use future technologies.

CTS provides secure information management and technology services to the North Dakota University System, linking academic and business services within the NDUS community, and by connecting users to the information and educational resources they need to accomplish their goals.

# A Message from the Vice Chancellor



Greetings,

It has been another challenging, productive, and rewarding year for Core Technology Services (CTS). While the world changed in early March as the pandemic hit, the CTS team quickly pivoted to remote work while continuing to provide the necessary support to the NDUS systems that our campuses rely on every day.

Working remotely has always been part of what we do at CTS. In the past, adverse winter weather sometimes required us to continue operating while some campuses closed and others remained open. This experience, along with extensive planning in the weeks leading up to the pandemic, helped us quickly and efficiently continue to work from remote locations. Our Enterprise Services team helped campuses move over 11,000 courses to our Blackboard environment in just over a week. Our Network Services team quickly worked to expand secure VPN services to remote workers. Our Endpoint team helped make sure all of our staff had the necessary equipment to work comfortably and effectively from their remote location. The list goes on and on. My heartfelt thanks to the entire CTS team that went above and beyond to ensure we could continue to operate during the pandemic.

An emerging focus for CTS is understanding and addressing our workforce needs for the future. We have a strategic goal to continue investing in our current staff and also identify new ways to attract and retain new staff. We have partnered with Lake Region State College (LRSC) and hired our first apprentice in Information Security. The LRSC apprenticeship program provides on the job work experience while also providing courses that lead to a degree. We are excited to have this program initiated and will work to grow the program to help CTS for the future. In addition, we are exploring formal and informal internships throughout the organization and expect to grow our capabilities in this area.

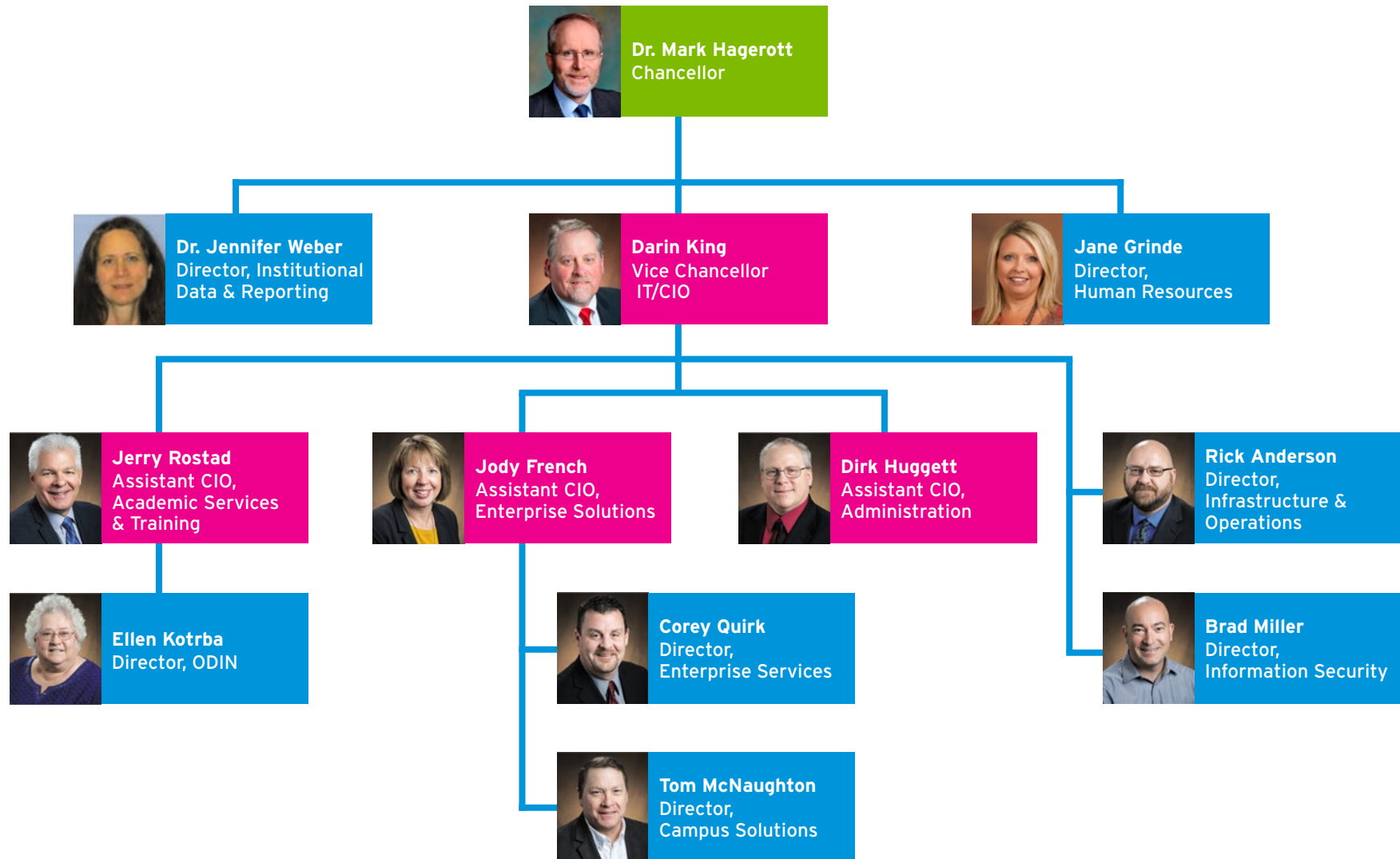
CTS continues to drive down operational tasks and increase time available to be spent on new projects that keep us moving forward. The pages below contain a summary of the work we have done during the past year and supports our ongoing commitment to operational effectiveness, providing value to the NDUS institutions, and continuously improving what we do every day. We look forward to continued collaboration with our stakeholders and strategic partners to execute initiatives that support the goals of the North Dakota University System, the institutions, and Core Technology Services.

Sincerely,

A handwritten signature in black ink, appearing to be 'W. R. ...'.

# Core Technology Services Leadership Team

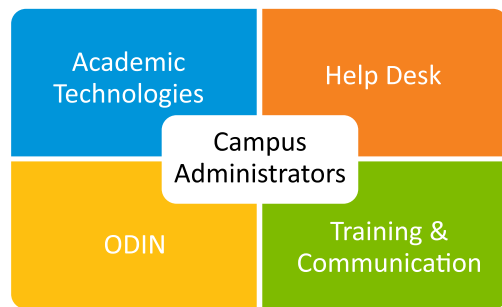
“Providing secure information management and technology services to North Dakota University System students, faculty, staff, and state residents.”



# Academic Services and Training (AST)

Academic Services and Training (AST) provides leadership in current and emerging technologies that expand and enhance teaching and learning across the North Dakota University System (NDUS). AST works with the institutions of the NDUS to develop and deliver enterprise-level academic systems, help desk support services, library services, and relevant training and communication support. By working closely with the institutions, AST collectively and collaboratively expands the capacity of online learning programs, collaborative learning environments, resources supplementing student education, and more.

In broad terms, the AST service line breaks into four quadrants:



The Four Quadrants of AST

## Quadrant One: Academic Technologies

AST supports an array of learning technologies used by institutions in support of both the online and distance learning experience as well as the face-to-face classroom experience. These technologies fill the three primary areas of academic tools, the learning management ecosystem, and productivity.

### Learning Management System

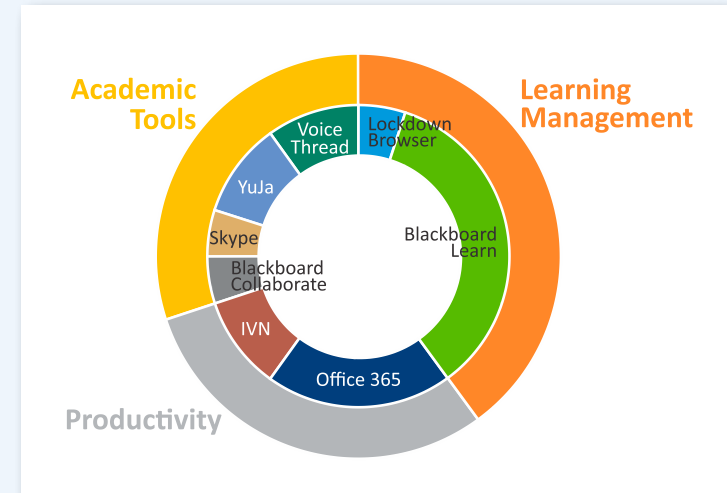
A learning management system (LMS) is an umbrella term used to describe software applications working in unison, enabling instructors to deliver online teaching and learning.

### Blackboard Learn

The centerpiece of the NDUS LMS is Blackboard Learn (Bb Learn). Bb Learn is a software application used for course delivery and includes administration, documentation, tracking, reporting, and grading. Bb Learn integrates with PeopleSoft to populate enrollment and grading information. Institutions use the LMS for online classes; however, there has been increased usage supporting face-to-face classes. Most institutions strongly encourage faculty to utilize the LMS and some have mandated faculty to post their syllabi in Learn as a minimum requirement. Over the Spring 2020 semester, Bb Learn became integral to delivering face-to-face courses online.

The shared environment provides a single location of coursework for students who may be enrolled in classes at different NDUS institutions. Additionally, faculty who teach at more than one NDUS institution now have a single location to manage their course materials.

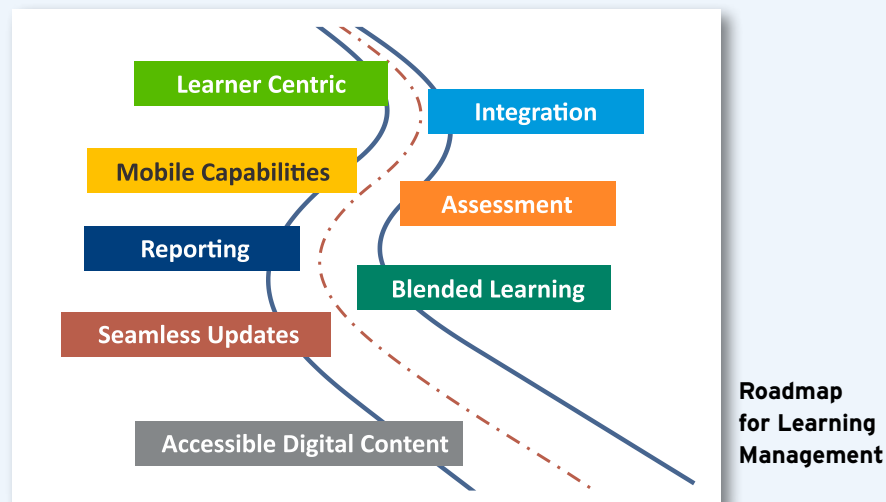
NDUS is looking at tools and functionality to improve and enhance everything from reporting to assessment to mobile capabilities.



Breakdown of Academic Technologies Quadrant



Learning Management Ecosystem



### Blackboard Ally

Ally builds a more inclusive learning environment and improves the student experience by adapting course content to their specific needs. As one example, Ally has the capability to convert certain documents from a written to an audio format. These features help students with disabilities, accommodate different learning styles, and make content more readily available. Ally is fully implemented by most NDUS institutions with a handful in final stages of adoption.

### VoiceThread

This web-based application allows participants to share conversations and make comments to presentations using a mix of video, text, and voice. Institutions are steadily adopting VoiceThread; during the 2019-20 academic year, threaded discussions increased by 32%. VoiceThread can be used inside or outside the LMS.

### YuJa Lecture Capture

Since adopting in Summer 2019, YuJa has become a “must have” tool for instructors, especially during the COVID-19 pandemic. This software enables faculty, students, and staff to record presentations, lessons, training, lectures, and more. Institutions have amassed thousands of hours of lecture recordings in the system. During the pandemic, NDUS YuJa storage increased on average of 103%. The addition of video streaming significantly reduces Blackboard’s course size and performance where video is paramount. YuJa can be used within the LMS or as a standalone tool.

### LockDown Browser

As the name implies, LockDown Browser is a custom browser that increases test security in Blackboard. Students are unable to use other features such as print, copy, or paste, navigate to another URL, or open other applications. LockDown Browser can also be used in tandem with YuJa for test proctoring.

## Video and Web Conferencing Technologies

AST supports three video and web conferencing platforms: Interactive Video Network (IVN), Blackboard Collaborate Ultra, and Microsoft Teams.

- IVN has been the backbone of distance education delivery since 1989. Working with North Dakota Information Technology (NDIT) for bridge and scheduling support, IVN delivers classes between NDUS institutions and geographically remote students. IVN is also used for statewide meetings. The capabilities of Pexip Desktop Video used in conjunction with IVN classrooms allows connections to expand beyond the classroom. During the Spring 2020 semester, Pexip desktop connections increased where face-to-face IVN classrooms were not available. Vbrick and YuJa provide recording options for videoconferencing along with editing features.
- Blackboard Collaborate Ultra is a desktop web conferencing platform which can operate within the LMS platform or as a standalone web conferencing tool. Instructors and students use Blackboard Collaborate Ultra directly from within their course environment for teaching, learning, office hours, tutoring, and presentations. NDUS staff and NDSU Extension staff use Collaborate for meetings and public training webinars.
- Microsoft Teams is a unified communication and collaboration platform combining persistent workplace chat, video meetings, file storage, and application integration. AST is assisting NDUS institutions with training and consulting as they replace Skype for Business with Teams.

## Microsoft Office 365

Office 365 is a suite of productivity tools and applications offered by Microsoft via cloud services. All NDUS institutions share a single Office 365 environment. Office 365 provides email, calendaring, and other productivity tools like Word, Excel, and OneDrive. It also continues to add new tools to the environment. During the COVID-19 crisis, the NDUS system office and institutions relied heavily on the collaboration tools in Office 365 to continue operations. With daily Microsoft Teams usage increasing by over 500%, CTS added additional audio-conferencing licenses to allow participants to use a phone to call into a meeting. Additionally, CTS has worked with Microsoft to arrange multiple Teams training sessions which will continue into the fall.

### Average Daily Microsoft Teams Usage:

	Pre COVID-19	Post COVID-19
Chat	3,855	13,175
Calls	25	213
Meetings	24	136



## Quadrant Two: Help Desk

AST provides Tier 0, Tier 1 and Tier 2 help desk services for the North Dakota University System. Supported systems and applications include:

- NDUS Account IDs and passwords
- Password changes
- ConnectND applications, including Campus Solutions/Campus Connection, Financials, and HCM
- Bb Learn
- Bb Collaborate Ultra
- SharePoint
- Office 365
- Teams usage with COVID-19
- 'How To' support for Exchange Email and Calendar

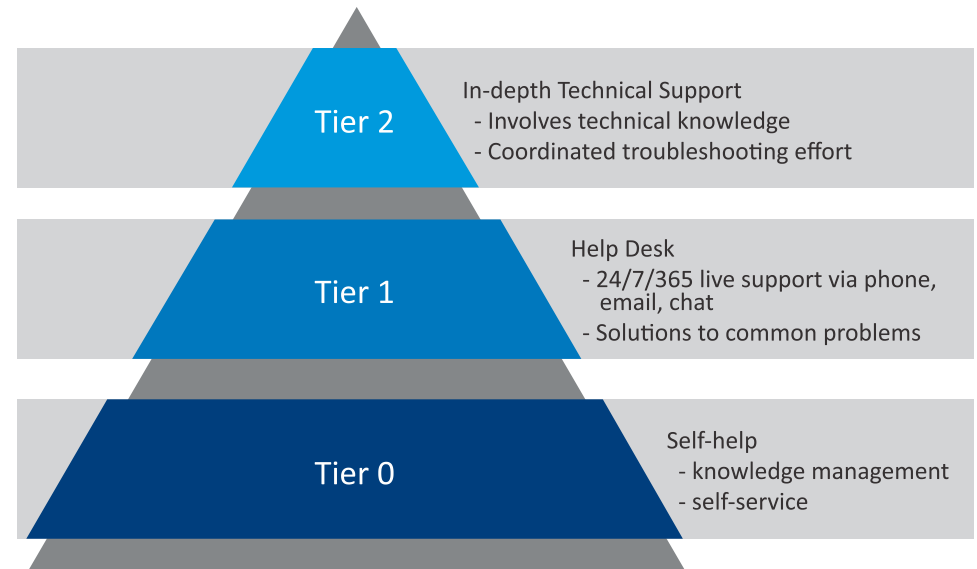
The Tier 1 help desk provides 24 hours a day, 7 days a week support. For FY 2020 (July 1, 2019-June 30, 2020), the Tier 1 help desk resolved 87% of the more than 23,600 contacts (about a 30% drop from last year). Of the contacts, more than 12,200 were telephone calls. The average speed to answer was 52 seconds (down by 20 seconds from last year), while the abandoned calls were just under 7.1% (down by 2% from last year).

Through CTS efforts in continuous service improvement, AST has adjusted how services are provided in the effort to reduce customer confusion and frustration, resulting in fewer contacts to the NDUS Help Desk. These efforts include redesign and simplification of the Campus Connection log in page, self-service password reset options, and an improved self-help via knowledge management.

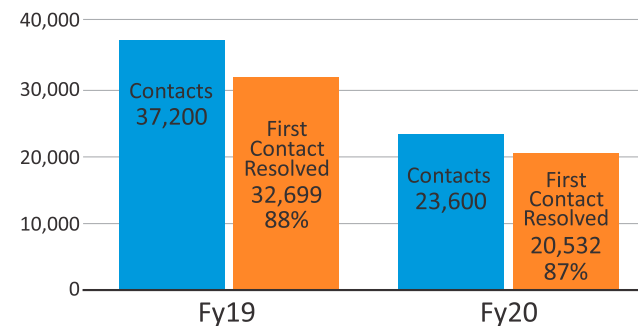
CTS customers access the knowledge management portal (RightAnswers) about 150 times per day, generating an average of 40 searches per day, since its launch in March 2020.

The top two goals of help desk services are 1) continuous improvement in customer service, and 2) increased productivity efficiencies. A primary help desk focus for the coming year is to deliver stronger self-service capabilities. Referred to as Tier 0 help desk services, self-service help desk support typically provides immediate solutions to problems, resulting in improved user experience with NDUS technologies. The RightAnswers software application will operate the Tier 0 environment.

### NDUS Help Desk Services



### NDUS Help Desk Contacts



## Quadrant Three: ODIN

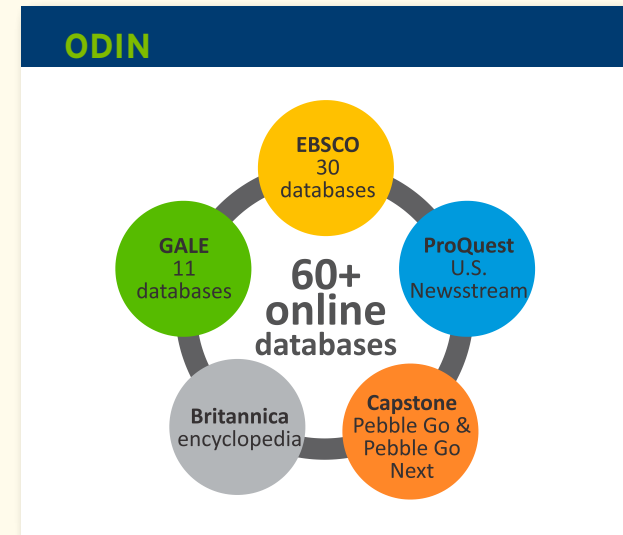
The ODIN system provides library management services for 60+ libraries across North Dakota, including all 11 institutions of the North Dakota University System. The remaining ODIN libraries are dispersed across North Dakota at private higher education institutions: K-12 schools, local public libraries, and special libraries.

Higher education library users search Primo VE, a discovery application allowing users to search for both print and electronic library resources simultaneously. Primo VE is connected to a library services platform called Alma by Ex Libris, which provides management functions like circulation control, course reserves, acquisitions/serials control and a resource-sharing function. Non-higher education libraries use an integrated library system known as Polaris by Innovative Interfaces, Inc. and have their own discovery interface. Both systems will interact with each other as needed.

ODIN also provides authentication services for over 60 licensed, full-text databases and similar online materials for more than 300 North Dakota libraries. ODIN posts monthly usage statistics for these databases.

A Shared E-Resources Task Force in the Minitex region (MN, ND, SD) successfully negotiated an electronic resources package. North Dakota representatives picked databases that will best enhance the education, economic development, and overall quality of life for citizens of North Dakota. E-Resources serve the full spectrum of library users from preschoolers, to post-secondary institutions, to lifelong learners in public and special libraries, and provides a robust digital environment.

The COVID-19 pandemic closed many ODIN libraries; however, most libraries worked out a plan to assist users in obtaining library materials as they worked remotely or within closed library buildings. Library staff used online resources, curbside services, and appointments to do what they could to assist users.



**"Libraries store the energy that fuels the imagination. They open up windows to the world and inspire us to explore and achieve, and contribute to improving our quality of life. Libraries change lives for the better."**

- Sidney Sheldon

**"If information is the currency of democracy, then libraries are its banks."**

- Wendell H. Ford



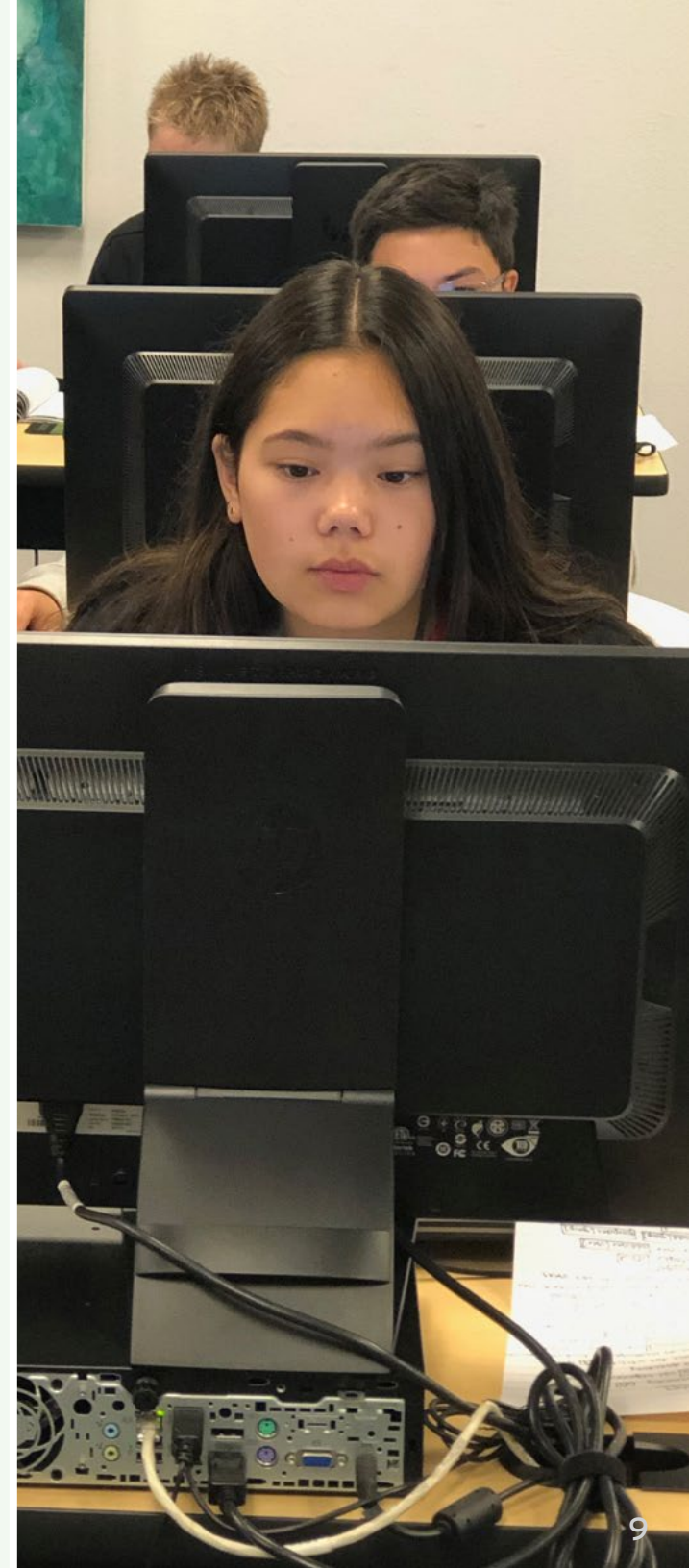


## Quadrant Four: Training & Communication

The AST Training and Communication quadrant consists of a mix of identifiable tools, solutions, and services that are reactionary in nature to emerging issues within the IT and NDUS Environment.

AST supports the following technologies and services in the training and communication quadrant:

- AST manages the state authorization process required for degree-granting, post-secondary institutions wanting to deliver curriculum in the state. All degree-granting, post-secondary institutions offering onsite or distance education courses in North Dakota must seek authorization or exemption under state law. AST staff provide the NDUS with leadership as the state portal agent and membership on the Midwestern Higher Education Compact Regional Steering Committee for state authorization.
- AST provides NDUS leadership for records management. AST works in coordination with records managers at each NDUS institution and North Dakota Information Technology (NDIT) to ensure records are properly maintained and disposed in accordance with state law. The Records Management group meets on a quarterly basis to discuss ongoing issues.
- AST led the redesign of <https://ndus.edu>, the NDUS System Office website. They also led the CTS website redesign <https://cts.ndus.edu>, which was completed in late 2019.
- Qualtrics is a survey software available to institutions wanting to participate. Eight of the 11 institutions are currently licensed to use Qualtrics and AST is often the first line of contact for access or usage questions. Training is provided on demand.
- Hoonuit is an online training resource used by students, staff, and faculty at these institutions: BSC, DSU, LRSC, MaSU, MiSU, NDSCS, UND, and the System Office. AST coordinates contract renewal and the integration of Hoonuit in Blackboard.
- As new technologies are rolled out, AST develops training resources and documentation which campuses can reuse or make derivatives of, and brand as their own. Training resources include, but are not limited to, face-to-face training sessions, webinars, training documents, tutorials, consultations, vendor presentations, and infographic materials. This year, training efforts focused on: Blackboard Learn end user and administrator training, Blackboard Learn Digital Teaching and Learning Series certification, Blackboard Ally, Microsoft Forms, Microsoft Teams, YuJa, and VoiceThread. AST also developed an NDUS repository site for all NDUS institutions to find and access COVID-19 information for transitioning courses to online delivery.
- AST prepared the NDUS COVID-19 Teams site made available publicly for campuses and all users to join. The site contains training resources to prepare campus faculty and staff for transition during the pandemic. Channels included Blackboard Learn, Blackboard Collaborate, IVN, Pexip, MeetMe, Office 365, Teams, VoiceThread, YuJa, along with a private channel for CTS employees only. Also, in response to the COVID-19 pandemic, CTS held a weekly webinar series from June 17 - July 22. During these seminars, faculty shared their experiences and best practices adopting NDUS academic technologies into their new online pedagogy.
- AST, in coordination with Academic and Student Affairs, developed a one-day conference held on March 6th to inform, update, and ignite interest for the use of Open Education Resources among NDUS institutions.
- AST, along with NDUS System Office, coordinated a Digital Accessibility Conference. The one-day conference explored topics on campus planning, legal ramifications, and workplace impacts. This conference was a follow-up to the new NDUS digital accessibility policy (SBHE 1203.1).
- AST continues to provide support to the NDUS Chancellor in the areas of cybersecurity and data analytics.

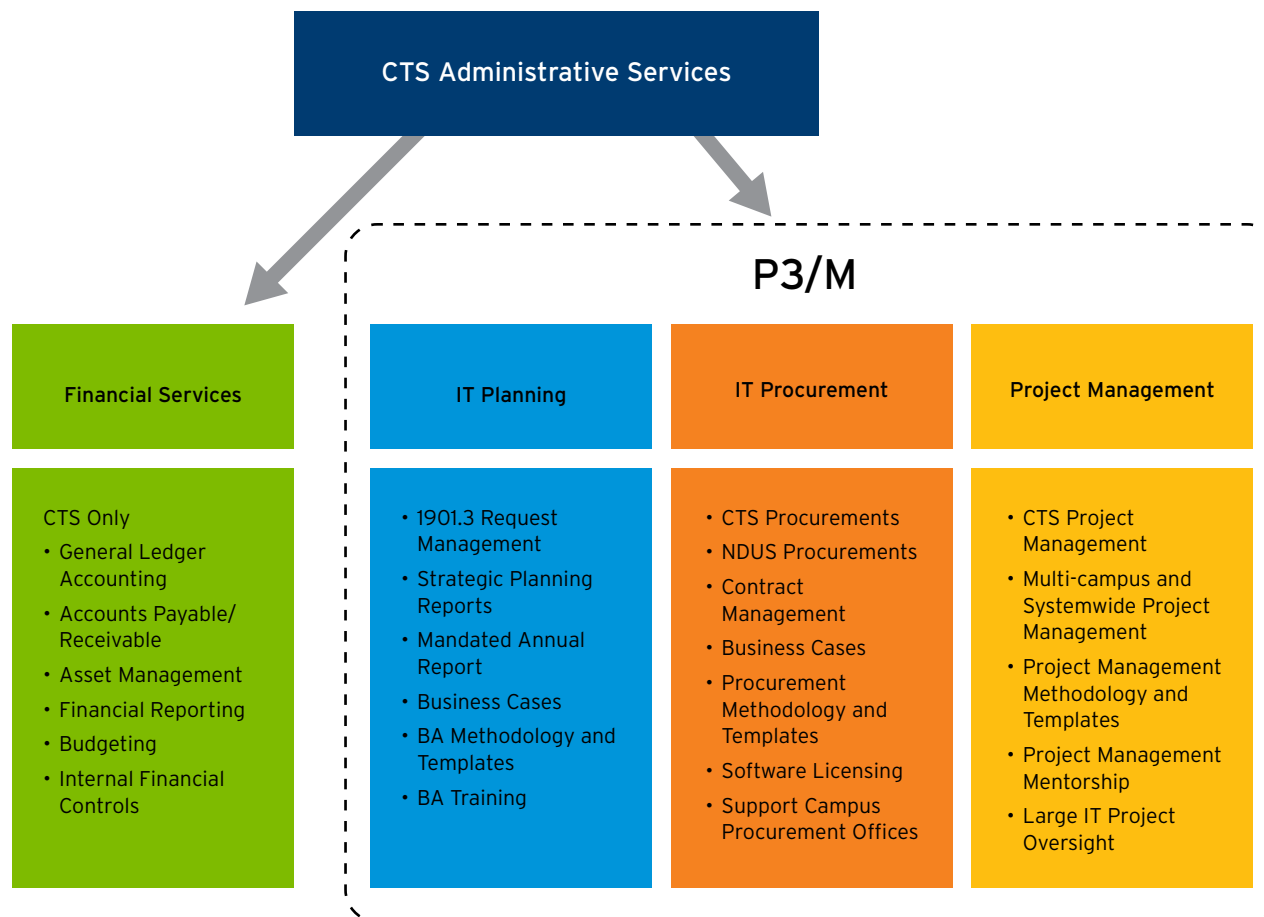


# Administrative Services (AS)

In July of 2019, CTS reorganized staffing and created the Administrative Services department. This department breaks into three functional areas as highlighted in the chart below: a general Administrative Services team, the Financial Services team, and the IT Planning, Procurement and Project Management team (P3/M).

## Administrative Services

The Administrative Services team handles the general administrative tasks for the Grand Forks site including the reception desk, meeting room setup, mail, travel arrangements, facility issues, and departmental data entry/file management.

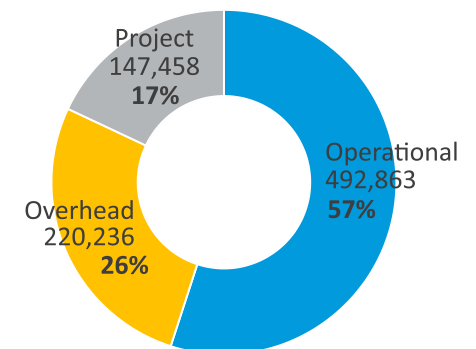


## Work Management System (WMS)

CTS implemented the TeamDynamix Work Management System in March 2015. CTS staff use the system for time and project tracking. WMS also provides other capabilities such as a service catalog and our ticketing system. AS leads a cross-functional team who provides the support for the tool.

This team is working on continuing to expand and revise our use of the system, develop better reporting, and improve CTS departments' productivity with the tool. Over the next 12-18 months, the team's focus will be on deploying more ITIL processes via the system.

## 860,557 Hours Recorded FY20



## Financial Services

The Financial Services team provides financial oversight for CTS in the following areas: accounts payable, accounts receivable, asset management, budgeting, financial reporting, general ledger and internal controls. Overall, the Financial Services team prepares and manages an annual budget in excess of \$38 million.

Current team objectives include streamlining processes to reduce financial transaction processing time, simplifying the budget process, and automating and publishing financial reports in a dashboard format.

## IT Planning, Procurement & Project Management (P3/M)

P3/M is responsible for issuing the mandated IT strategic plans and annual report, overseeing all CTS procurement, and performing all Level 3 & 4 procurements for the organization. This team also manages some of the most complex projects and performs Large Project Oversight as mandated in N.D.C.C.

### IT Planning

The IT Planning team is responsible for assisting NDUS and all institutions with developing the biennial IT Strategic Plan and publishing required reports. This area utilizes business analysis practices and supports the rest of the organization with templates and training. Key reports that are published to the CTS website include:

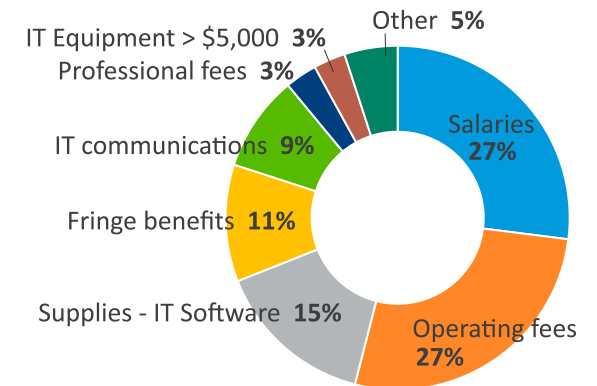
- The CTS Annual Report
- The Performance and Accountability Report
- The CTS Strategic Plan
- The biennial IT Strategic Plan

The team continues to work in collaboration with the North Dakota Information Technology (NDIT) department on the mandated biennial Statewide IT Strategic Plan by collaborating with CTS leadership and campus CIOs to ensure projects and campus initiatives are reflected on the dashboard. The purpose of the dashboard is for stakeholders to view at any time, up-to-date initiatives that are happening around the state.

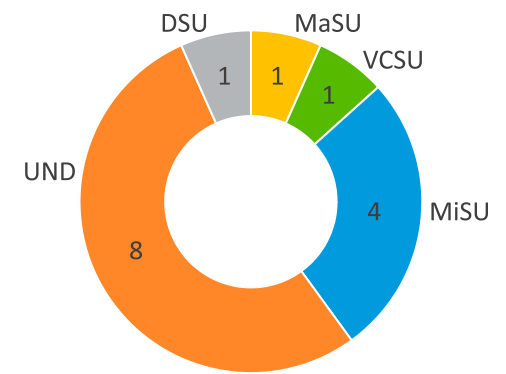
Another responsibility of this team is to coordinate the review and approval process for institution IT requests known as 1901.3 according to the corresponding policy number. These requests are vetted for approval, evaluating factors such as cost, resources, and schedule. There was a total of 15 requests submitted this past fiscal year.

The team collaborated with the CTS staff this past year to develop the first CTS Strategic Plan to ensure the organization is aligned with the system strategic plan as well as identifying any new strategic directions. This group continues to work on updating the 1901.3 Policy and NDUS Procedure and improving the process all together.

## FY20 Budget



## Submitted 1901.3s FY20



## Procurement

The procurement team supports both CTS and the institutions with IT purchases and software research. This area manages over 150 active contracts and offers centralized contracts that can be utilized by any NDUS institution. Further responsibilities for this team include ensuring CTS remains in compliance with all software licensing agreements and providing support to the system office for larger, complex procurement processes such as selecting the search firm for the UND Presidential search. Additionally, the procurement team participates in state and national procurements, collaborating with the State Procurement Office and the Midwest Higher Education Compact.

The team's focus over the next 12 months will be to update existing RFP templates utilizing the latest information from the State Procurement Office and lessons learned, developing a bid template, and updating the current IT Contract template to include the latest recommended terms for IT purchases.



## Project Management

The project management team manages some of the most complex projects in the organization, many of which affect multiple institutions. This area is also responsible for performing Large Project Oversight as mandated by N.D.C.C.

This past year, the P3M department participated in CTS's externship program, an experiential learning opportunity for current employees to work in another department within the organization. This externship provided an employee the chance to acquire and develop the skills necessary for Project Management as well as understand how the organization applies the North Dakota methodology to all projects managed by P3M's Project Managers.

Overall, CTS has completed 111 projects this past year; additionally, the organization had 10 cancelled projects and 18 on hold. Currently, there are 30 projects classified as new or in-process status, with most scheduled to be completed within the fiscal year 2021.

### Active Projects

- **Novelution:** This product is a module-based, electronic grants administration application purchased by UND and NDSU; it provides a central, active system for researchers to track their projects and ensures consistency, accuracy, and compliance using forms, workflows, and accessibility. This year, both campuses successfully implemented the first module, Sponsored Research, which was much appreciated by researchers and staff working remotely. Work has begun on the second module, Institutional Review Board (IRB), scheduled to go live in September 2020. This project is under Large Project Oversight and continues on schedule.
- **Recruiting Solutions:** This project focuses on the deployment of the PeopleSoft Human Capital Management Recruiting Solutions module to nine of the 11 campuses, including the NDUS HR office. Recruiting Solutions includes the components Candidate Gateway and Talent Acquisition Manager. Deployment of the module for the remaining two campuses is expected in fall 2020.
- **NetIQ Program:** This program contains multiple projects including an upgrade to many components within the NDUS identity management solution, NetIQ, along with building and implementing an infrastructure to enable new features and functionality. The upgrade of NetIQ has been completed and the research of the new features has begun.
- **Supplier Management:** To maintain existing suppliers and to efficiently manage supplier growth, CTS plans to implement PeopleSoft Supplier Connection. This self-service web application features employee-facing (internal) and supplier-facing (external) transactions enabling suppliers to view and modify their own business information at their convenience.
- **Authentication Redundancy:** This project will guide the implementation of a cloud-hosted solution to provide authentication redundancy in order to obtain access to cloud-based applications should the state network (STAGEnet) or data center become unreachable.
- **Maxient:** This project deployed a new solution for conduct case management. Campuses will use this product to handle both student and employee conduct issues as well as Title IX case management. The solution will provide critical federal reporting for these programs. Nine campuses have deployed or are finishing their deployment of this product.
- **Splunk:** This project implements the Enterprise Security (ES) product using the current centralized logging vendor (Splunk). Enterprise Security provides the necessary data analysis to determine the appropriate data is being logged and tracked, along with possible fine-tuning of the data supported by the system. This project is in the planning stage.





- **ACA:** Advanced Computational Systems provides the ability to process data and perform complex calculations at high speeds. It has been more than a decade since the University of North Dakota entered the world of ACA; to remain a leader in the highly competitive field of higher education research, progression and advancement of hardware, software, and flexibility of use are important factors of ACA services. UND is working to expand their current ACA services outside of the standard ACA configuration and offer a private cloud environment that faculty and graduate student researchers can access, configure, and utilize.
- **UND Network Building Upgrades:** The University of North Dakota (UND) and Core Technology Services (CTS) identified several buildings needing significant network upgrades to deliver an increased level of service within the UND campus community. Work is being performed via the UND/CTS service level agreement (SLA) that details agreed upon services from CTS to UND. Work is expected to be completed by September 2020.

### Completed Projects

- **FAMIS Cloud:** This project (under Large Project Oversight) carried out the transition of existing facilities management software to the vendor's cloud-based solution for participating campuses. The project team completed the project in January 2020.
- **Spirion:** This project implemented Spirion for CTS and 9 NDUS institutions. CTS and the institutions had a large amount of restricted data on end user systems that was at risk of loss or theft, which could have potentially led to a costly breach event. The risks of a data breach are always considered high, both to the reputation of the NDUS and member institutions, and due to the large costs incurred from breach response efforts, penalties, legal liability, and loss of future tuition and research grants. Spirion will help CTS and member institutions discover, reduce, and protect student and employee restricted data across faculty and staff endpoint computers. Deployment to identified institutions and CTS was completed in November 2019.
- **Library Services Platform:** As noted in the ODIN section of AST, ODIN solicited for a system to replace its Aleph library application and selected Ex Libris' Alma & Primo applications. This project met the requirements for Large Project Oversight. They began implementation in the fall of 2019 and went live in the summer of 2020.
- **Campus Solutions 9.2 upgrade:** The latest version of Campus Solutions includes significant enhancements and functionality designed to meet the mobile challenges facing Higher Education students in their everchanging world. Oracle's latest release delivered functionality labeled "fluid," allowing Campus Solutions to become truly mobile-compatible. Additionally, the CS team reduced application customizations across the environment by over 20%. This upgrade went live in July 2019.
- **Management of NDUS Dotted Identifiers:** This project authorized resources to identify, schedule, and conduct the required work to convert the NDUS account (dotted identifier) name change process connected with downstream applications within CTS and the 11 NDUS institutions. The project went live on August 5, 2019.
- **Communication Application Implementation:** To better communicate outages to stakeholders, CTS purchased and implemented the Sorry application, allowing application owners and system administrators to quickly send notifications to subscribed students, faculty, and staff. CTS implemented this application in December 2019.



# Enterprise Solutions (ENSO)

The Enterprise Solutions department includes Campus Connection, Financial Systems (FIN), Human Capital Management (HCM) teams, and Enterprise Services.

Enterprise Solutions supports the three pillars of ConnectND, North Dakota's implementation of Oracle/ PeopleSoft, including Human Capital Management, Financial Management and Campus Connection, along with dozens of ancillary systems for the eleven institutions in the North Dakota University System. All three systems use similar processes and tools to ensure business continuity such as version control and migration software, development request methods, and patching procedures.

Enterprise Services is responsible for administration of enterprise-class information technology solutions including Blackboard, document imaging services, and a Service Level Agreement for applications administration with the University of North Dakota.

A governance committee and multiple user groups support each of the ConnectND, Blackboard, and document imaging services to ensure strong relationships and focused strategy and innovation.

## Three Pillars of ConnectND

### Campus Connection

- Student Finance
- Financial Aid
- Campus Community
- Admissions
- Student Records
- Student Academic Advisement

#### 3rd Party Systems of Campus Connection

- Ad Astra
- Class Scheduling
- Anthology Application
- College Scheduler
- Degree Map Planning
- Facilities Management
- Follett Bookstore
- Maxient Student Conduct
- National Common Application
- National Student Loan Data System
- Parchment Transcript Services
- Parking (T2)
- Scholarship Management
- Starfish Student Success
- Target X Application System
- The Housing Director
- Touchnet Payment System

### Financial Systems

- Banking
- Budgeting
- Grants
- Supplier Management
- Travel & Expense
- Purchasing
- General Ledger
- Asset Management
- Pcard/SUA
- Accounts Payable
- Commitment Control
- Cash Management
- Project Costing
- Billing
- Proposal Management
- Accounts Receivable
- Treasury

### Human Capital Management

- Core HR
- Payroll for NA
- Benefits Administrator
- Time & Labor
- Absence Management
- Recruiting Solutions
  - Candidate Gateway
  - Talent Acquisition Management
- Budgeting
- Onboarding
- Commitment Accounting
- Contract Pay
- Savings Management
- Flexible Spending Accounts
- Company Director/Org Chart
- ePerformance

## Campus Connection

Campus Connection is the system of record for more than 46,000 active students of the North Dakota University System. The system supports all 11 institutions with day-to-day operational data and functionality for every aspect of the student learning cycle, including Financial Aid, Admissions, Student Records, Academic Advisement, and Student Financials. In addition, Campus Connection feeds 40 additional University System data systems, including Housing, Parking, Facilities Management, and scheduling (Ad Astra). Lastly, Campus Connection supports Blackboard Learn, Starfish, and other systems related to student success and intervention initiatives. While each module supports its functionality, the total environment seamlessly tracks student progress, registration, graduation, and overall success.

### COVID-19

Campus Connection houses discrete details about the daily activities of students, faculty, and staff. When the North Dakota Department of Health (DoH) needed assistance with COVID-19 support and contact tracing, they turned to CTS for assistance. CTS provided access and reporting which dramatically reduced the contact tracing time and improved the overall abilities of the ND DoH's processes. Additionally, CTS provided the necessary aggregate data to locate testing centers around the state to support student, faculty and staff testing. Lastly, Campus Connection was able to seamlessly support Blackboard on the migration to a fully online format to accommodate this spring's transition to distance learning.

### Data Warehouse/Reporting Review

CTS engaged with Catch Intelligence to evaluate the current NDUS reporting structures. This engagement included feedback from all stakeholders of the university system, concluding with an outcome of a formalized strategic direction and a roadmap forward to support the various needs from all levels of leadership.

### Improved Campus Connection Experience

CTS has completed many changes this last year to improve the Campus Connection experience for students, staff, and faculty. **Maxient**, a new software to manage student conduct, has been well received by all institutions. This software change not only offers student tracking capabilities, but Title IX and staff conduct tracking and reporting. **Parchment**, and its integration with Campus Connection, has provided major efficiencies by automating transcript orders and uploading of transcripts. **Delegated Access** was deployed to all NDUS students to allow them the ability to let parents or sponsors view a portion or all of their Campus Connection information. **College Scheduler**, expanded to all 11 institutions this year, allows students to easily see all available schedules for a term based on their plan, breaks, and preferences. Students can also compare schedule options based on all sections offered to find the best fit for their daily activities. **Student Retention** Student intervention and success is a continuing initiative related to Starfish and the use of the SLDS data,

combined with real-time reporting that creates a holistic approach. These systems gather information from various sources to produce data driven insight into student academic progress. In turn, institutions can use the data to make better informed decisions. CTS also designed an online Computer Based Training (CBT) to assist support staff with complex reporting out of the PeopleSoft environments. This continues to be a work in progress as we focus on building Microsoft Power BI reporting into our overall reporting strategy.

### TouchNet

TouchNet is the vendor utilized for all payments within the University System. It includes single sign-on capabilities with easy access for parents and students making electronic payments. The "Marketplace," or storefront functionality, also connects to our third-party vendors, including Anthology, Target X and the Parking systems.

### Statewide Longitudinal Data System (SLDS)

The SLDS provides K-20 longitudinal data reporting. It is a collaborative effort involving the North Dakota University System, the Department of Public Instruction, the Department of Commerce, Job Service North Dakota, and the North Dakota Information Technology Department. Current projects through the SLDS are the Financial Aid Scholarship Management System and the Reverse Transfer initiatives which provided avenues for degree completion and students graduation rates. Additional data, overview and research are located at <https://www.slds.nd.gov/>.



### Other Campus Solutions Initiatives:

- Participated in the annual Bank of North Dakota Application Fee Waiver event; over 2,500 North Dakota students completed free applications to NDUS institutions during this event.
- Implemented efficiencies through class scheduling software with the use of Ad Astra "Monitor" to track real time classroom utilization.
- Expanded and implemented additional built-in functionality including Communications, Student Center and Veterans Benefits.
- Added enhancements to Integrated Postsecondary Education Data System to (IPEDS) reporting to streamline and automate processes and build consistency in reporting efforts.
- Initiation of evaluation of a Content Resource Management system and application process for students that apply to NDUS.
- Deployed multiple bolt-on systems to support institutional requests and continued efforts related to Target X and the National Common Application for UND & NDSU. This proof of concept products helps students and advisors recruit, communicate, and assist the student application processes.

## Financial Systems (FIN)

The NDUS PeopleSoft Financial System is the system of record for the North Dakota University System business operations. The system supports all 11 institutions with day-to-day operational data and functionality for every aspect of the University System's budget. The system contains a wide variety of modules such as General Ledger, Budget, Accounts Payable, Grants, and Travel & Expense.

The FIN team provides daily support of the PeopleSoft financials application and related ancillary systems for all 11 institutions, the System Office and CTS. This area also conducts central processing for the University System such as generating 1099s, completing fiscal year end activities, performing PCard and bank statement extracts/uploads, applying system patches, and assisting institutions with troubleshooting financial transactions.

The FIN team also provides leadership in application management by representing the NDUS at the Oracle Higher Education Product Advisory Group, a global organization working closely with users and key Oracle Strategists to improve the Academic Advising functionality for all institutions. A member of the NDUS team chaired that group in the past.

The team continuously works to improve quality and functionality of the system. Some of this year's successes include:

- Implementing electronic approval workflows throughout Accounts Payable, GL, and other modules for campuses that had yet to convert to this process. The COVID-19 pandemic emphasized the need for use of workflows as employees transitioned to work from home.
- Developing an improved process for audit professionals to access institution data in accordance with an updated FERPA agreement between the NDUS and the Office of the ND State Auditor. HCM and Campus Connection also implemented this model of access.
- Completing post implementation improvements for the Single Use Account (SUA) including the utilization of the Automatic Reconciliation feature in the Banking module and enabling all registered suppliers to be active. An External Transaction page was developed in Banking allowing campuses to account for miscellaneous transactions that are imported with the bank statement from JPMorgan.
- Participating in a legislatively funded e-Procurement study along with campuses and the Office of Management and Budget (OMB). Civic Initiatives conducted the study in three phases including: Solution Definition and Stakeholder Engagement, Market Research & Target Implementation Strategy and Automation Roadmap Development. A funding proposal for the upcoming legislative session is in preparation by OMB.

- Completing the Supplier Management project, which facilitated a clean-up of the existing Supplier database based on guidelines from an NDUS working group. This work group also served as an advisory group for the deployment of the e-Supplier Connection module, giving suppliers the ability to self-register and update their own information. This implementation impacts all 11 institutions as well as Core Technology Services (CTS) and the System Office (SO).

Future projects include adding more Fluid (mobile-friendly) features throughout the Financials system.



# Human Capital Management (HCM)

Human Capital Management is the PeopleSoft solution that serves as a global foundation for HR data. The system supports all 11 institutions with day-to-day operational data and functionality for nearly every aspect of the system's 8600+ employees.

The HCM team provides support of the system including activities such as administering the NDUS semi-monthly payroll for all 11 institutions, the System Office, and Core Technology Services, applying system patching, providing WSI annual workers compensation reports, processing W-2s and 1095Cs, and assisting institutions with troubleshooting HR transactions. Manager Self-Service (MSS) and Employee Self-Service (ESS) ensures workflows for transactions process efficiently. The HCM team also provides leadership in application management by providing training to institutions and serves as active participants in the HR user group & Human Resource Council. The team continuously works to improve the quality and functionality of the systems. Some of this year's successes include:

- Implementing Recruiting Solutions, which provides a Candidate Gateway and Talent Acquisition Manager module. The modules streamline the recruiting process, resulting in a more positive experience for candidates, hiring managers, and recruiters. The systems allow campuses to generate reports and track their recruitment metrics more easily and efficiently. In addition, CTS supported a Request for Proposals for job recruitment/advertising services to procure cooperative contracts with competitive pricing. A post project was also completed, providing text messaging services to better engage job candidates in recruitment communication.
- Developing new earnings codes and reporting in response to the Families First Coronavirus Response Act (FFCRA). In collaboration with a campus working group, detailed instructions were created for entering information regarding the various emergency sick and FMLA plans within the Act. The team assisted many campuses in designing solutions to best manage temporary layoffs due to the COVID-19 pandemic.
- Participating on the HCM Advisory Group as part of the national Higher Education User Group (HEUG), working closely with other higher education experts and Oracle to improve the Human Capital Management functionality.
- Engaging with Oracle's various focus groups including Onboarding, Payroll for North America, Time and Labor, and Approvals and Delegations. Participating in focus groups allows input on the footprint and delivery of Oracle modules as well as enhancements to modules.
- Creating new benefit plans in response to legislative changes along with reporting requirements to NDPERS.
- Automating bio-demo information to NDPERS, creating efficiencies, and removing duplicated entries for campuses.
- Concluding research on the implementation of the ePerformance module, a performance management solution which streamlines the appraisal aspect of the staff development process, from goal planning and coaching to performance assessments and rewards. Implementation has been postponed, as the COVID-19 pandemic has placed constraints on budget and project stakeholders within the NDUS.
- Completing summer and end-of-year patching for PeopleTools and image upgrades as well as other valuable customer features.
- Delivering the new W-4 form as released by the Internal Revenue Service.
- Upgrading Kaba middleware used for physical time clocks in high traffic departments.

Future projects include additional Manager Self-Service (MSS) functions including pay rate changes and transfers, fluid e-Forms, and a return to the implementation of the ePerformance module.

## Recruiting Solutions

Easily Search for a Position to start a new job opening:

Applicants easily register, search, and apply for jobs via Candidate Gateway:

Recruiters can easily manage applicants and the hiring process via Manage Job Opening:

Conduct Screening and Route Applicants to Hiring Teams:

Schedule Interviews:



## Enterprise Services (ES)

Enterprise Services (ES) is the business unit responsible for design, development, implementation, maintenance, and administration of enterprise-class information technology solutions while providing IT leadership, vision, and planning for the University System. The unit supports enterprise-level software applications including a document imaging system, secure managed file transfer, learning management systems, student information systems, Web solutions and mobile applications. Enterprise Services is comprised of teams that are highly integrated to provide complete solutions to serve the needs of NDUS constituents.

### Learning Management System

Blackboard, the NDUS system-wide Learning Management System (LMS), delivers a single instance LMS to create a unified user experience across the 11 institutions and the System Office. With the conclusion of the Summer 2020 term, this will be the first full academic year with all 11 campuses on the system-wide LMS. The team continues to provide current production support, training, and planning, as well as third-party and custom integrations, advanced reporting, and grades integration into Campus Connection. Along with being presented the 2019 Blackboard Catalyst Award for Leading Change at the Annual Blackboard Conference in July 2019, the implementation team also presented a session on the 2+ year project of combining 11 campuses into one unified LMS.

CTS is in the early stages of implementing Analytics for Learn (A4L). A4L provides student performance reporting by extracting data from Blackboard Learn and bringing it into an analytics framework, where it's combined with data from Campus Solutions and other data sources as reports dictate. The first phase will include reporting capabilities for 3 campuses as well as the System Office. CTS plans to complete phase one of the project in the late fall 2020 or early spring 2021.

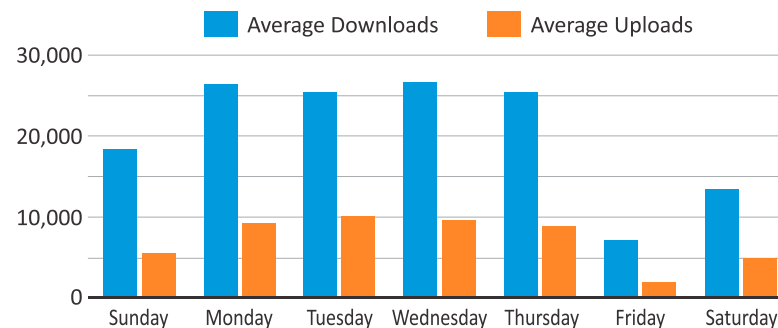
Future initiatives include research and potential implementation of Ultra. Ultra is a redesign of the Blackboard Learn user interface, offering a more contemporary teaching and learning experience with a focus on mobility. NDUS started the pilot of Ultra base navigation in February of 2020; because of COVID-19, the system suspended the pilot due to resource allocation needs at the campuses as well as CTS. The plan is to restart the pilot in October 2020. The team is also working on increasing existing security – multi-factor authentication for use by individuals with elevated user accounts as well as possible integration with a future release of the NDUS SSO portal.

### Secure File Transfer System

ES continues to provide configuration and administrative services for LiquidFiles (sendfiles) and MOVEit MFT (Managed File Transfer) Solution, offering secure exchange of critical business data and sensitive files both internally and externally. These systems ensure delivery to the intended recipients and document transfer activities with an audit trail and enforces file retention policies. On average, the MOVEit system moves approximately 100,000 files a day, with users/systems averaging uploads of over 7,000 files and downloads of over 20,000. The sendfiles system has sent over 2,925 secure messages to date.



### MOVEit Average Daily Downloads and Uploads





## Data Analysis System

The Splunk team has expanded its use of Splunk across various areas of CTS for log analysis, monitoring, and alerting. The team continues to add systems for log indexing including Nutanix, Tenable, Palo Alto, and BitGravity. Splunk is currently indexing an average of over 100,000,000 events per day. CTS acquired more capacity to allow for indexing of more data sources in the future, up to 200Gb/day.

## Mass Communication Delivery Systems

The ES staff administers and maintains the day-to-day operations of the statewide Listserv system as well as the NDUS Blackboard Connect notification system. Currently within the Listserv system, there are 4,195 lists, averaging over 37,700 emails a month to subscribers. The Blackboard Connect system has 42 unique sites across the 11 institutions and System Office. NDUS uses Bb Connect to send targeted emails, phone calls, SMS (texting), as well as other message types. For FY19, campuses sent over 1,500 unique email messages and called an additional 3,500 phone numbers. UND operations has it configured with the National Oceanic and Atmospheric Administration (NOAA) for severe weather alerts.

## UND SLA

CTS provides application administration for nearly 40 software applications hosted in the data center – On-Premises (OP) and in a cloud service – Software as a Service (SaaS).

Software Application Administration Services include:

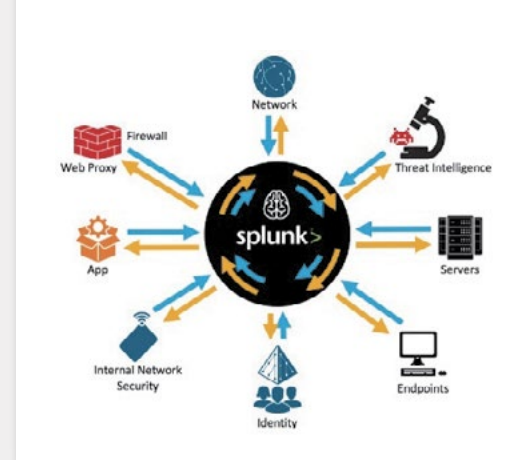
- Architectural design (OP)
- Application and Desktop Virtualization (OP)
- Installation and implementation (OP)
- Domain Management (OP/SaaS)
- Administration (OP/SaaS)
- Upgrades and patching (OP) Server replacements (OP) Security (OP/SaaS)
- Integration and Middleware (OP/SaaS)
- Backup (OP)
- Data recovery (OP) Tuning (OP) Support/Troubleshooting (OP/SaaS)
- Vendor relations (OP/SaaS) Budget (OP/SaaS)
- Contract renewal (OP/SaaS)

## Document Imaging

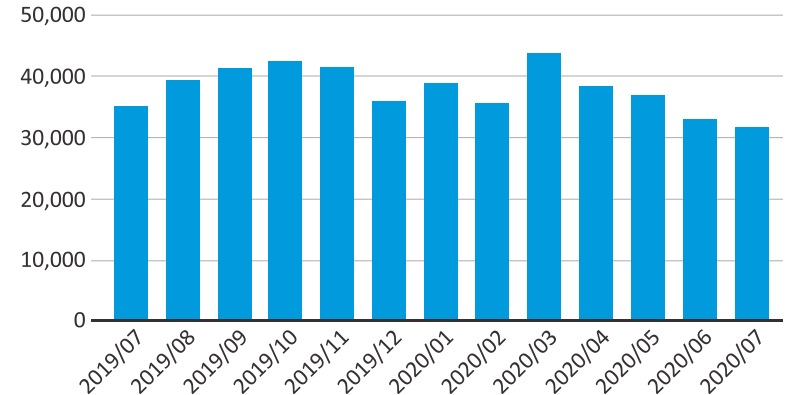
Within the last year, the document imaging team expanded their product and service offerings throughout the NDUS system. One expansion included a cross-institutional electronic process for Admissions, enabling applicants to attend a collaborative institution. The team assisted the System Office in creating an electronic application and workflow approval process for the Career Builders Scholarship.

CTS has established document storage for Human Resources (HR) in eight of the eleven institutions. The team will continue to focus on expansion and look to further develop the HR footprint in Perceptive Content. The team successfully implemented the Retention Module in five institutions, with a focus on student records. Implementation of the Retention Module is currently in progress for Finance, Human Capital Management, Student Finance, and Financial Aid.

With the expansion of the DocuSign form solution throughout NDUS, the team created an integration allowing for import automation of the completed documents between Perceptive Content and DocuSign. Campuses continue to highly utilize the other form solution, TransForm. In FY 19, there were an additional 56 forms created, bringing the current number of forms available to 203. The total number of form submissions for the fiscal year was 78,257, an increase of 13,338 submissions over last year. In addition to the completion of various projects, the team also completed 2,210 support tickets across the eleven institutions, CTS, and the System Office. This was a decrease of 301 tickets from last year, as institutions attended train-the-trainer sessions, enabling them to provide additional user support.



## Listsrv Messages Sent



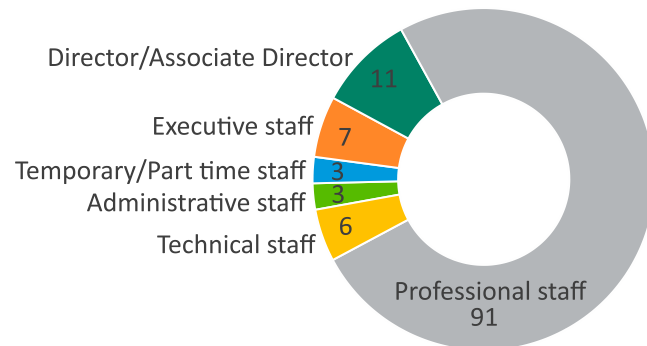
# Human Resources (HR)

The Office of Human Resources provides HR services and support to CTS and System Office staff of approximately 145 employees. HR supports the mission of the NDUS and CTS by providing services that attract, develop, and retain a highly qualified and diverse workforce. HR services include recruitment, employee relations, learning and development, performance management, HR information management, policy implementation, policy compliance and employee engagement/recognition. The HR team consists of one director and two part-time administrative support positions.

**CTS FTE\* as of 6/30/2020: 121**

\*full-time benefited constitutes employees working more than 20 hours per week

## CTS Staffing Breakdown



## Recruitment

The HR team assists CTS and System Office leaders in fulfilling recruitment requests with well-qualified candidates within a minimal turnaround time. The HR department also advises the System Office on presidential searches.

## Learning and Development

CTS provides employee professional development using several delivery methods, including both formal and informal opportunities. CTS delivers formal on-site training to staff at least once per year by collaborating with the organization's employee assistance provider, Village Business Institute. Additionally, CTS uses various online systems to deliver web-based training courses in a variety of areas. Employees participate in mandatory compliance training on an annual basis in the areas of fraud, security, and internal controls. In addition, employees have access to an online system called Hoonuit, formerly known as Atomic Learning, which offers a variety of training topics from Microsoft tutorials to workplace behavioral and environmental topics. CTS allotted a budget to each division, allowing prioritization of professional development requests within each department. HR offers supervisor training quarterly.

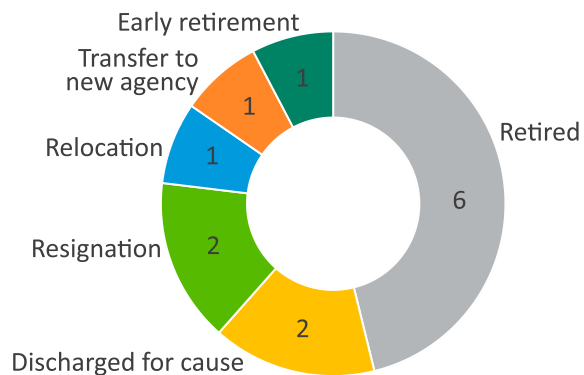
## Performance Management

The HR department provides advisement and facilitation for employee performance management. A consistent process is in place for both CTS and the System Office to implement employee annual performance reviews, which has contributed to a successful completion rate for the past three years.



**CTS FY20 turnover rate**  
**11.1%**

### CTS Turnover Breakdown



## Salary Administration

The primary purpose of salary administration is to attract and retain well-qualified employees who can best contribute to the mission of the organization and the North Dakota University System. Decision makers in the salary administration process strive to make salary decisions fairly and communicate accordingly. HR oversees annual salary administration and market salary analysis. Market is derived by benchmarking positions against similar positions using salary surveys recognized by the North Dakota University System/Human Resource Council. HR compiles data on an annual basis ensuring current position data is matched and updated to the most recent market survey.

## Employee Engagement and Recognition

Employee engagement is a priority at both CTS and the System Office. Both organizations hold annual staff recognition gatherings and several informal employee events throughout the year. In addition to events, employees are encouraged to participate in anonymous surveys that aim to gather feedback to improve morale. NDUS/CTS Staff Senate and the NDUS compliance office support the surveys with HR oversight.

## Human Resource Council (HRC):

CTS Human Resources is part of a larger system council called the Human Resource Council (HRC). The HRC advises the chancellor, institution presidents and University System councils on human resource issues. The HRC also facilitates collaboration between institution HR staff to reduce inconsistencies in business processes, data entry, reporting, and policy and procedure implementation. The NDUS/CTS HR Director serves as the System Office liaison to the HRC. HRC council membership includes human resource directors from each institution and three employee designees: one from a two-year institution, one from a four-year institution and one from a research institution.

A recent goal attained by the HRC was to align meetings to the system culture, meeting monthly as opposed to quarterly. The HRC also approved the development of a system-wide HR measures dashboard made possible by the NDUS Institutional Research team. The dashboard includes employee demographics and turnover rates that can be viewed as a system or individual entity.

### Future goals for HRC include:

- Collaborate on ideas to improve employee morale. Recent budget cuts placed added pressure on staff workload and the elimination of annual increases for the past two years has had a significant impact on morale.
- Create a system HR toolbox for the new workplace situation due to COVID-19 to include resources to assist campuses with employee telework agreements, emergency leave, TEAMS training, and training for remote workers and supervisors.

# Infrastructure & Operations (I/O)

Infrastructure and Operations (I/O) is a business unit of Core Technology Services (CTS) and is comprised of the following sub-units:

- Database Administration
- Data Center/Production Control
- Endpoint Services
- Identity and Access Management
- Network Services
- System Administration

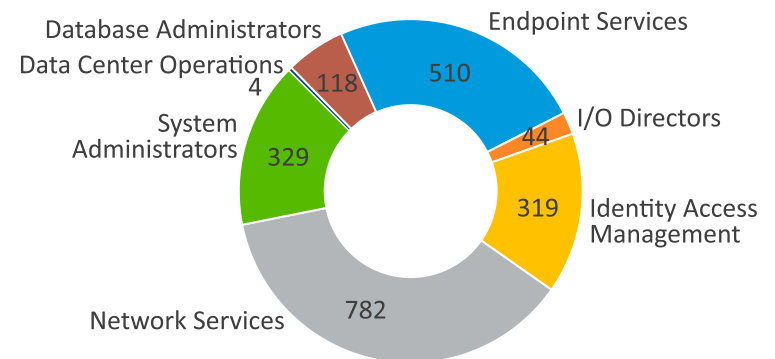
Infrastructure & Operations strives to provide, sustain, and enhance, a robust, reliable, and relevant technological foundation used across the NDUS. Departmental successes are directly attributable to staff who are action and detail-oriented, committed, and passionate subject-matter experts of many technologies.

Managing service requests is a significant portion of I/O workload. The department handled over 2,100 service tickets last year.

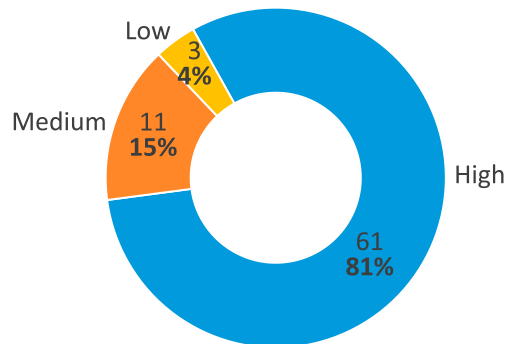
I/O personnel conducted 75 root cause analyses for unplanned outages. In 81% of those analyses, staff had a high confidence level the underlying causes had been identified. With this information, preventative actions can be established and implemented to avoid a recurrence of comparable incidents.

I/O stakeholders completed 213 survey requests; the percentage of satisfied/very satisfied responses ranged from 94% to 98% in the areas of resolution timeliness, customer service, and competency.

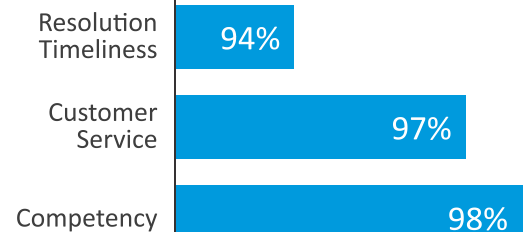
## FY20 Tickets by Sub-Unit



## Confidence Level that Underlying Cause of Unplanned Outage is Known



## Satisfied/Very Satisfied



## University of North Dakota (UND) Service-Level Agreement (SLA)

I/O personnel provide the following services to the UND:

Data Center/System Administration	Database Administration	Identity & Access Management	Network Services
Data center facility management	Database hosting and administration	Identity system administration	Campus LAN/WAN management, including high performance computing
Server hosting (physical & virtual) and administration – IaaS, PaaS and SaaS	Capacity planning	Account provisioning	Data Center network management
Information Security – vulnerability management, backup/recovery, data encryption	Software installation	User account services	Network monitoring and analysis
System monitoring and analysis	Install patches and upgrades	One-off account creation	IP address management, including DNS and DHCP
High performance computing	Monitoring and analysis	User Account Auditing	VPN Management
	Backup and recovery		Campus wireless management
			Network security



## Data Center Operations

The NDUS-CTS Data Center provides power, cooling, space, and Remote Hands support staff for the technology needs of higher education stakeholders and partners throughout the region. Skilled staff work 20/7 with established processes and approved operational governance practices to ensure safe and secure data processing in a mission-critical facility.

Building infrastructure remained uninterrupted during this year's maintenance cycle.

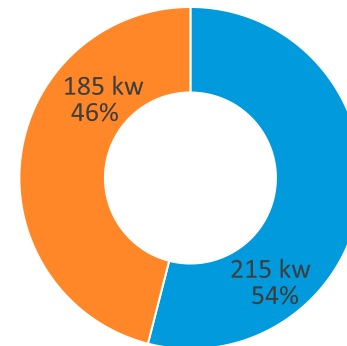
**NDUS Data Center Availability**  
**100%**

## Database Administration (DBA)

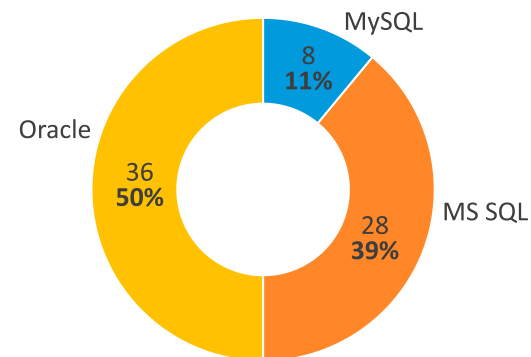
The Database Administration (DBA) team provides enterprise-level software systems administration. Additionally, the team is responsible for physical and logical configuration planning of enterprise-level architecture, technical implementation, and ongoing management of software to support local and enterprise-wide applications. The team ensures operational stability, integrity, and security of database management software and their respective interfaces. The team supports standalone and clustered databases on multiple database platforms and performs technical functions in support of database-driven applications.

During the past year, the DBA team was integral to the success of several new software integrations in support of multiple applications on several platforms. The team successfully completed numerous application and security patches, as well as refreshes, across all layers and platforms to ensure best security practices. Work continues to further utilize the added functionality and security offered by Oracle's Exadata Cloud at Customer (ExaCC) product. Expected benefits of ExaCC are increased transaction rates, reduced IT infrastructure costs, reduce unplanned downtime, and improved efficiency of IT staff.

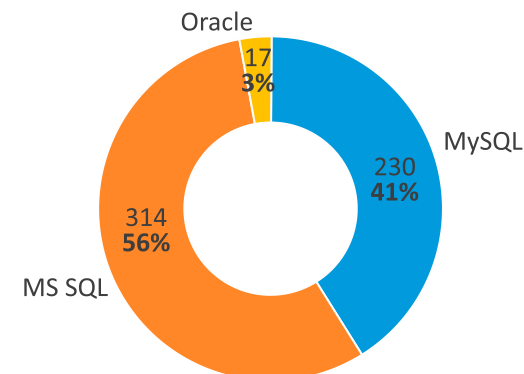
### Total Power Capacity 400 kw



### Database Instances by Product



### Databases by Product





## Endpoint Services

Endpoint Services provides technical support to the NDUS System Office and Core Technology Services. In addition, the team provides assistance and consultation to institutions.

Endpoint Services team members are active in maintaining and improving the Team Dynamix environment and expanding Power BI reporting. Endpoint Services continues to support and enhance end user backups using a cloud solution and has further improved the deployment and patching functionality of the Microsoft Endpoint Configuration Manager (SCCM) environment. Endpoint successfully handed off the NDUS public cloud environment to the System Administration group, but assists as needed.

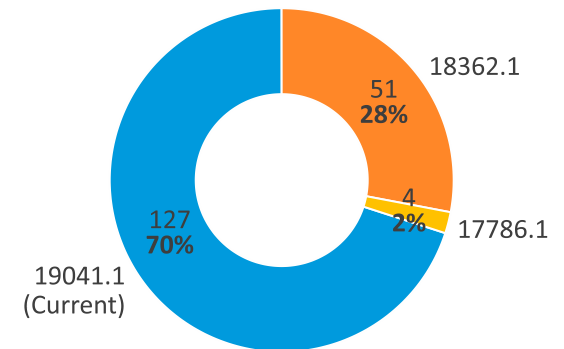
The team helped to implement and manage a notification system, referred to in the organization as "status.NDUS." Stemming from this, Endpoint Services set up and manages CTS's text and email notification services for various NDUS applications. Additionally, the Endpoint Services team has assisted with numerous application development projects, including a database for NDUS Financial Aid's Indian Scholarship program and the Recruiting Solutions website integrations for the campuses.

Device management this year included updating CTS monitors to standardize hardware and reduce the need for extraneous peripherals. The new monitors work directly with our standard laptops, minimizing the need for docking stations.

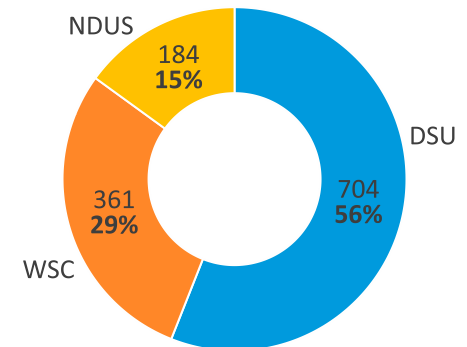
In response to the COVID-19 pandemic, CTS purchased additional hardware and Endpoint Services deployed the equipment to facilitate work from home solutions for users. Videoconferencing is rapidly evolving, and Endpoint Services has been involved in helping with cloud-based Teams and Zoom conferencing solutions, as well as continuing to look for new and better videoconferencing options for our traditional conference rooms. Endpoint Services has also worked to make the support processes safer and more effective in the context of remote work, and have found ways to provide timely, interactive support that also respects the safety and boundaries of the team and the colleagues being served.

Endpoint Services works with the staff of many campuses to provide support and technology solutions relevant to their needs. A highlight of this past year was completing the integration of Williston State College (WSC) into the NDUS SCCM environment, making it easier for WSC to deploy, manage, and update user and lab computers. The Endpoint Services team is also working with campuses to begin leveraging cloud device management using Microsoft Intune and other technologies.

### Operating System Build for CTS and SO



### Managed Clients by Institution



## Identity & Access Management (IAM)

The IAM team is responsible for managing the identity life cycle for all students, staff, and faculty within the NDUS. The team maintains the complex administration and oversight of NDUS people, processes, and products, and governs identities and access to resources of the enterprise environment. The team ensures users have quick and secure access to the resources they need, while providing strong authentication without restricting productivity, and ultimately simplifying the process of gaining access to IT resources.

The IAM team successfully upgraded Identity and Access Management (IAM), NetIQ Access Manager (NAM), and Self-Service Password Reset (SSPR) this year. NetIQ continues to integrate their products to form a unified structure for IAM Governance. The goal of implementing IAM Governance will provide administrators and managers with tools to easily collect relevant user and access information, ensure that users have focused access, and provide access request and approval.

**Total Number of Accounts**  
**465,202**

**Accounts Used Regularly**  
**80,202**

**Accounts Created**  
**35,941/Year**

**Records Processed**  
**90,202/Day**  
**47.9 Million Annually**

## Network Services

The Network Services team is responsible for enterprise-level network administration as well as the physical and logical configuration planning of enterprise-level architecture, technical implementation, and ongoing management of the UND Network. Additionally, the team works closely with NDIT in providing network services via STAGEnet (North Dakota's Statewide Technology Access for Government and Education Network) to institutions. This year, Network Services added an additional staff position and has been working on restructuring the department and cross-training new staff members.

Ongoing information security and continual service improvement assessments resulted in recent upgrades to the latest network design for all three office buildings, including switches, licensing, and wireless. The deployment of a new data center network infrastructure, consisting of 100G backbone services, will position CTS to take advantage of automation and security technologies, such as micro-segmentation. This allows for better efficiencies in management and increases the security posture of the data center environment. In partnership with CTS's System Administration team, Network Services set up a cloud environment to allow for off-site redundancy for specific services. This environment includes secure networks protected by next generation virtual firewalls and is available to customers dynamically via global traffic management solutions. Both teams are currently working together on providing additional security in the data center environment.

### Partnership with NDIT

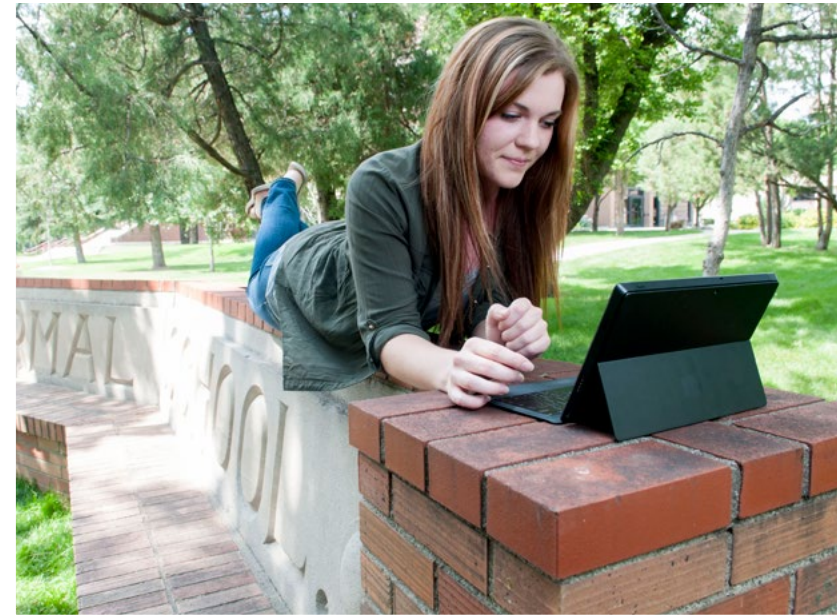
A partnership with the State of North Dakota's Information Technology group (NDIT) provided fiber redundancy to 2 campuses (VCSU and MISU); this is a first step in increasing the reliability of the NDUS STAGEnet network. CTS collaborated again with NDIT to manage the Firewall infrastructure for all 11 institutions and has worked to deploy remote VPN services at many campuses in response to the COVID-19 pandemic. The team is also working through the network steering committee to review the current VPN solutions in an effort to combine and streamline the service for the NDUS.

Additional work with NDIT includes a cooperative arrangement to support the common communications systems required for secure and reliable access to both NDUS-hosted and outsourced applications, along with network interconnectivity between institutions and to the Internet. Both teams worked with UND to conduct an RFP to allow campuses to outsource their residence hall network equipment, support, and administration; although a bid was awarded, no campus has utilized this option.

Network Services provides centralized DNS/DHCP and IP address management for the NDUS while allowing for role-based access controls for campuses. This year, the team added additional DNS appliances to WSC and BSC to augment existing services and provide better failover and redundancy, as well as visibility, to the services for more efficient management.

### UND Network Support

CTS supports the UND campus network, consisting of approximately 15,000 wired connections and over 20,000 wireless devices connected during the semester. This year, Network Services worked closely with UND to upgrade access switches and wireless access points in 8 locations as part of a planned upgrade. As building wireless upgrades are completed, these areas are positioned



with WiFi 6 access points to provide fast and more robust wireless connectivity to campus users with wireless clients that are WiFi 6 enabled. The benefits of WiFi 6 include faster speeds than previous standards and can accommodate two to three times as many clients per access point. This new hardware allows CTS to provide better visibility to the University's IT staff (UIT) for more streamlined troubleshooting and monitoring of resources. This also provides next generation networking, which allows for network changes to be based on user identity versus port locations.

To provide a better wireless experience for students, large classrooms and lecture bowls were reviewed and upgraded to high density wireless. Buildings included in the upgrade: School of Medicine and Health Sciences, Hughes Fine Arts, Chester Fritz Auditorium, and Abbott, Gamble, Leonard, and Merrifield Halls.

## COVID-19 Preparation

In preparation for returning to classes in the fall semester while maintaining social distancing and the hybrid course environment, substantial work was done in the residence hall network including the addition of 10G broadband to Johnstone/Fulton University Place, Hancock Hall, Conference Center, Bek Hall, Walsh Hall, Squires Hall, and Swanson Hall. Wireless access was upgraded in University Place, Fulton, Hancock, and Squires residence halls, allowing students to take classes from their rooms. A new residence hall core was deployed to allow for high-speed connectivity and to replace aging equipment. Wireless was augmented in buildings such as the Chester Fritz Auditorium to allow for high-speed coverage while social distancing.

## Wireless Support

Additionally, Network Services deployed a new network identity management product that provides a secure wireless environment for UND and CTS. The system now authenticates and encrypts all wireless traffic as it is transmitted across the network. The product also assists students with onboarding their devices, allowing them to securely connect in a seamless fashion to the university wireless network. During peak periods, over 12,000 devices are connected to UND's wireless network; the majority are iOS devices, including includes iPhone and iPads, as well as Mac OS X devices. These two operating systems make up over 78% of authenticated devices on the UND campus wireless. Additional work with UND included migration of the Aerospace building to the campus core, increasing security, redundancy, and efficiency in management and traffic flows.

## Roadmap

The Network Services roadmap includes continuing to automate systems and services to ease the burden of manual work on staff, continue to provide additional self-service options for UND and Endpoint Services help desks, increase security across the Data Center and the UND campus, and work on disaster recovery/business continuity solutions.





## System Administration

The System Administration team is responsible for enterprise-level hardware and operating system administration. Additionally, the team is responsible for physical and logical configuration planning of enterprise-level architecture, technical implementation, and ongoing management of server, backup, and storage hardware and software to support local and enterprise-wide applications. The team ensures operational stability, integrity, and security of servers and storage hardware and software to enable CTS departments and institutions to provide services to staff, faculty, and students. By implementing numerous efficiencies through virtualization and automation, the number of team personnel has been able to be reduced from 14 to 7 positions over time. The System Administration team has moved to hyper-converged infrastructure (HCI) and has consolidated 99% of the systems to one 11 node virtualization cluster. This system backs up to an encrypted converged data management backup system in the data center and stores off-site archival copies to a remote disk system.

### Public Cloud

Working alongside Endpoint Services, Network Services, and Enterprise Services, the System Administration team was able to bring on extra public cloud capacity for campuses to support significant increases in demand during the COVID-19 pandemic. This transition allows for greater consistency in support, costs, and security between the on-prem and cloud servers.

During the past year, the Systems Administration team was integral to the success of two major initiatives, the upgrade to Campus Solutions 9.2 and the implementation and migration to Oracle's Exadata Cloud at Customer (ExaCC) infrastructure. The team also conducted a review of CTS and UND technologies to ensure compliance with NDUS information security standards.

### UND Advanced Computing Administration

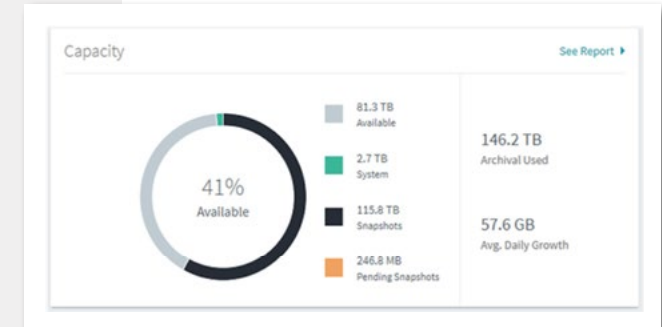
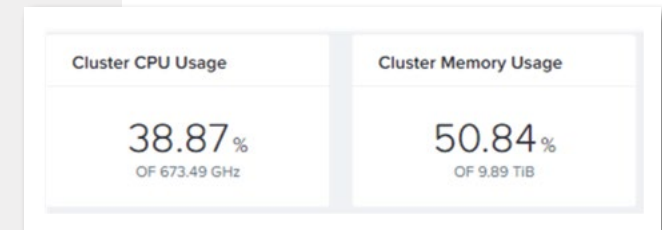
The System Administration and Network Services teams worked with UND on the Advanced Computational (ACA) systems which provides high performance computing. This work included setup of a new local cloud cluster and integration of old clusters into this environment. The teams is working with NDIT and NDSU to create a 100g Science DMZ, a secure computer subnetwork designed to address performance limits that might occur during high volume data transfers. This system will allow for faster resource sharing between UND and NDSU, enabling improved system utilization and collaboration between campuses.

### System Administration for NDUS

The System Administration team is involved with the majority of projects for NDUS and some of the campuses as they are one of the starting points for server and application creation and hosting. The team also assists with projects such as solutions provided for single sign-on for on-prem and cloud-based vendors. The team is responsible for Microsoft Active Directory support, providing storage or assisting in finding solutions for entities within CTS and throughout NDUS, providing SMTP email services to campuses outside of Office 365 based solutions, and providing system monitoring and alerting via our enterprise monitoring solution.

### Data Center

CTS continually researches new products and services for our next generation Data Center to determine which will support CTS in meeting the needs of the institutions, the strategic plan, and the mission of the organization. Products researched must be efficient, adaptable, follow industry best practices, help provide data protection, have high availability, and be cost-effective.



# Institutional Data & Reporting (IR)

The Office of Institutional Research is responsible for system-wide institutional research for State Board of Higher Education reporting, legislative requests, Chancellor studies, required federal and state reporting, and other ad-hoc data requests. IR conducts studies, maintains datasets, and reports information on topics such as enrollment, retention, degree completion, productivity, and other areas of interest. The four main areas of work for Institutional Data & Reporting include:

## NDUS System Office Data and Reporting

System Office IR staff serve to fulfill data needs of the State Board of Higher Education, Chancellor's Office, legislature, and governor's office. They also contribute to statewide committees relating to workforce needs, K-12 education, and the state data warehouse. Ongoing responsibilities include:

- Annual enrollment reporting (fall, spring, annual), program enrollment and completion
- Development and maintenance of the State Board of Higher Education Strategic Planning dashboards
- Integrated Postsecondary Educational Data System (IPEDS) keyholder services for NDUS institutions as well as eight additional ND private and tribal schools
- Support of System Office and institutional staff for Strategic Planning Online (SPOL) software used for documenting strategic planning at all levels of the system
- Provision of requested data and/or reporting for legislature, governor's office, workforce, media, and other ad-hoc requests
- Representing NDUS for the interagency North Dakota State Longitudinal Data System (SLDS)
- Contribute to CTS collaboration on Power BI application standardization, training, and services
- The team was instrumental in assisting the State in developing its COVID-19 dashboards as well as developing the NDUS COVID-19 dashboard at <https://cts.ndus.edu/coronavirus/>

## Data and Reporting Services

As of July 1, 2017, the ND Department of Public Instruction (NDDPI) contracts IR services through the North Dakota University System. NDUS-IR works collaboratively with NDDPI and NDIT to provide services that include development and implementation of the federally required K-12 district profiles, accountability reporting, and state/school district public dashboards.

## NDUS Systemwide IR Collaboration

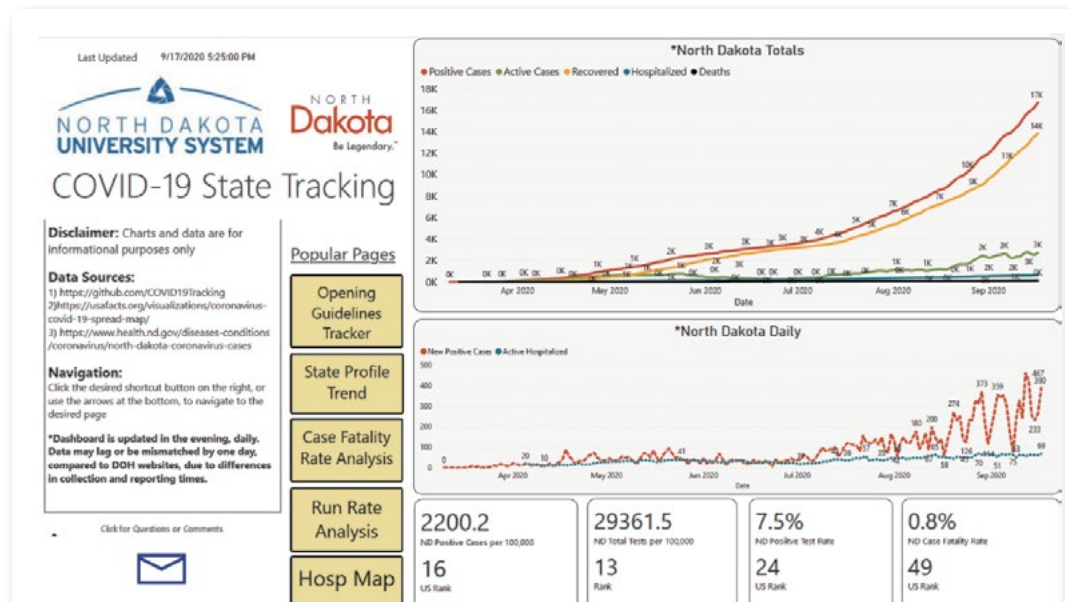
The Office of Institutional Research team leads the collaboration effort of the IR staff among all NDUS institutions and the System Office. Known as the Institutional Research Users Group (IRUG), members meet monthly to discuss, critique, and plan for data reporting and processes across the university system to validate data and methods are consistent, and to ensure IR staff are supported in their work and professional development needs. The IRUG also gathers twice per year for an extended face-to-face meeting and communicates daily on the IRUG listserv.

## NDUS Shared IR Services

The shared services provide contracted data and reporting services to NDUS institutions, focusing primarily on federally and state mandated reporting, including IPEDS and Student Achievement Measures (SAM).

## Future Goals for Institutional Data and Reporting

- Collaboration to establish a strategic plan for data access and support for dashboards across the university system
- Establish departmental standards for survey and qualitative data analysis





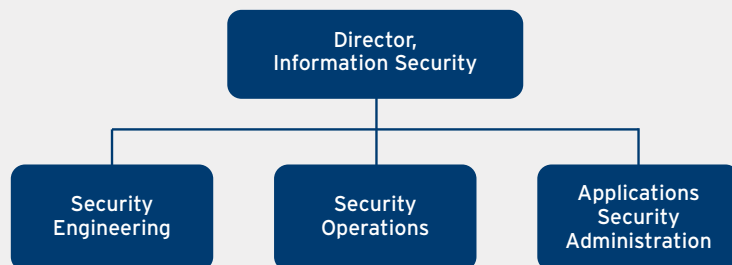
# Information Security (InfoSec)

The Information Security Department (InfoSec), in collaboration with the NDUS Information Security Council (ISC), has identified 10 strategic initiatives as part of a 5-year plan. These initiatives are aimed at protecting CTS systems and data from known cyberattack vectors. These initiatives align with the Center for Internet Security's (CIS) 20 Critical Security Controls (CSC), which are a set of actions for cyber defense that provide specific and actionable ways to thwart the most pervasive attacks. InfoSec also utilizes the National Institute of Standards and Technology (NIST) Cybersecurity Framework (NCF) as the foundation for much of its security planning efforts.

Strategic Initiative	Center for Internet Security (CIS) Critical Security Controls (CSC)	NIST CyberSecurity Framework (NCF)				
		Identify	Protect	Detect	Respond	Recover
Systems and Software Management	2, 3, 5, 7	✓	✓	✓	✓	
Data Loss Prevention	13, 14	✓	✓			
Endpoint Security	2, 3, 8, 13	✓	✓		✓	
Vulnerability Management	1, 2, 3, 4, 5, 8, 9, 11, 12, 15, 18	✓	✓	✓	✓	
Penetration Testing	20	✓		✓		
Centralized Logging	4, 6, 7, 8, 12, 16, 19			✓	✓	
Identity & Access Management	4, 11, 12, 15, 16	✓	✓		✓	
Intrusion Prevention Systems /Firewalls	7, 12, 13, 14, 19		✓	✓	✓	
Security Awareness	17		✓		✓	
Security Operations	1, 3, 6, 8, 19			✓	✓	✓

## Strategic initiatives as part of a 5-year plan.

To better support the NDUS strategic security initiatives and accommodate the complexity of the security threat landscape, the NDUS Information Security Department will be reorganizing into the following structure:



The Information Security Department will be expanding staff and operations, including adding a Security Operations Manager and an Information Security apprentice and intern. CTS is working to strengthen the next generation workforce to ensure that skilled IT workers are available in North Dakota. This program includes working with high school and college students through intern and mentoring programs. Working with the Grand Forks Public Schools, CTS has completed the first high school internship and plans to continue this program next summer with additional interns. In partnership with Lake Region State College, CTS has hired their first apprentice through the LRSC apprentice program. This program allows the apprentice to work full-time for CTS while attending courses online with LRSC. Skills learned in the classroom are put into practice at CTS and validated to ensure the apprentice can fully utilize those skills. Work with college campuses is also underway to hire part-time students who will participate in a scaled down version of the apprentice program while fulfilling the needs of CTS.

CTS led an information security strategic planning summit held in FY20 and increased collaboration with the North Dakota Information Technology (NDIT) department. Those efforts guided the department to identify the following security initiatives as priorities for information security.

## Data Loss Prevention

**Sensitive Information Discovery** - Avoiding loss of data is paramount to security. Information Security has procured a sensitive information discovery product called Spirion, which NDUS will continue to deploy and expand to find sensitive data on NDUS systems and reduce the footprint.

**File and Folder Encryption** - When campuses must store sensitive data on NDUS systems, protecting it from unauthorized access is critical. Information Security will be exploring endpoint, server, and cloud encryption solutions, such as Microsoft Information Protection (MIP), to further protect sensitive data.



## **Endpoint Security**

Endpoint Detection and Response (EDR) - In the past year, Information Security has deployed a security detection and response platform called Palo Alto Cortex XDR. CTS installed the Cortex XDR endpoint agent on all CTS and NDUS System Office computers to provide a security incident detection and response capability. In the coming year, Information Security will look to offer and expand this capability to NDUS institutions.

Mobile Device Management (MDM) - The Information Security department recognizes that many of the faculty and staff members at NDUS Institutions are increasingly using mobile devices to access NDUS and institution systems and data. Making sure these devices are secure from attack and compromise is a priority for NDUS. The security team will explore MDM platforms, such as Microsoft Intune, in the coming year.

## **Vulnerability Management**

Vulnerability Scanning for Internal Systems - NDUS currently scans thousands of systems across CTS and 11 campuses with the Tenable.io Vulnerability Management system implemented by the Information Security department. This system is helping to mitigate threats and reduce the attack surface to systems, services, and applications. Much of the current vulnerability scanning activity at NDUS Institutions is focused on external-facing systems and applications. Future efforts will focus on expanding these scans to more of the internal systems and applications housed at NDUS Institutions.

## **Centralized Logging**

Centralized Logging for NDUS Institutions - Information Security and a CTS functional team have worked to implement Splunk centralized logging to assist in identifying security risks and conducting incident response for CTS systems and applications. Future efforts include providing centralized logging capabilities for NDUS Institutions.

## **Systems and Software Management**

Email Security - Hackers use email and other collaborative systems to introduce many of the threats faced by the NDUS Institutions, including malware, ransomware, phishing, fraud, data loss, etc. Information Security will be exploring various capabilities, such as Microsoft's Office 365 Advanced Threat Protection (ATP), to address and minimize this increasing risk.

Patch Management - Keeping our systems and applications patched and up-to-date is a critical activity to keep data and systems secure from attack. Information Security will be exploring systems and improving processes for patch management.

## **Security Operations**

Security Operation Center (SOC) - In the upcoming year, Information Security will be standing up a Security Operation Center (SOC) to continuously monitor the security posture within the NDUS with the intent to prevent, detect, analyze, and respond to cybersecurity incidents happening at CTS and NDUS Institutions.

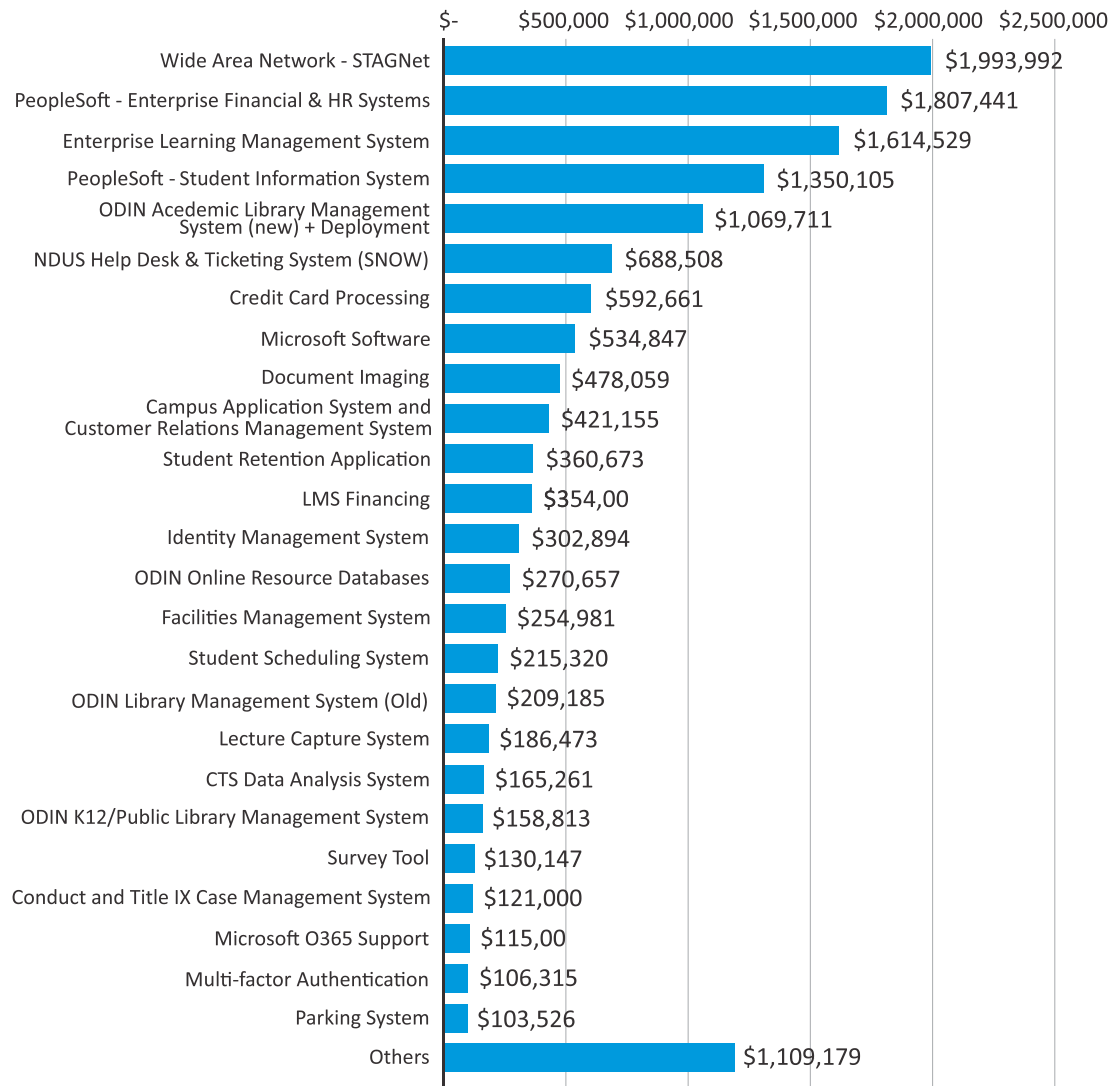
Centralized Security Orchestration, Automation, and Response (SOAR) - In cooperation with NDIT, and to support the SOC, Information Security will be implementing the Palo Alto Cortex XSOAR platform in the upcoming year. This platform will allow the SOC to manage the response to security incidents and alerts, streamline security processes, connect various security tools and systems, and enable automated responses for repetitive security tasks that don't often require human intervention. This will allow security operations analysts to be much more efficient at handling the many security incidents and alerts occurring daily across the NDUS, therefore allowing them to focus on more urgent and critical incidents.

Security Information and Event Management (SIEM) - NDUS systems, applications, and networks are generating a huge amount of security events and logs. A SIEM analyzes and correlates these logs and alerts on the important security events. A SIEM will allow the SOC to be much more efficient and increase the likelihood that the SOC will be alerted to important security incidents occurring throughout our environment. Information Security will be implementing Splunk Enterprise Security (ES) which is a SIEM that will enable the SOC to quickly detect and respond to internal and external attacks.

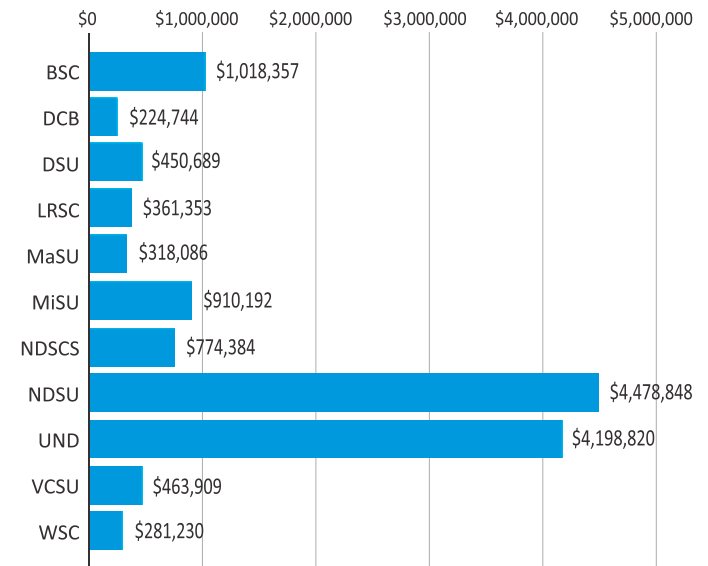
# NDUS System Service Cost Evaluation

NDUS System Services  
Spend-per Student per Year  
**\$400.61**

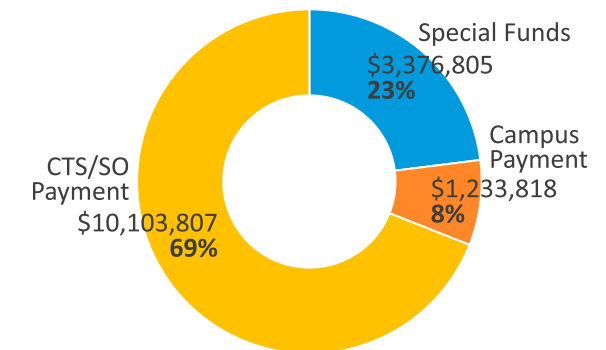
## Cost by System Service (Over \$100,000)



## NDUS System Services Spend by Campus (Student FTE)



## NDUS Support for System Services



# Core Technology Services – Goals

Four goals provide Core Technology Services (CTS) with the guiding principles for information technology planning and system implementations. This framework allows for the information technology goals at the eleven institutions to roll into the goals of CTS and ultimately make their way into the strategic plan of the State Board of Higher Education.

## **Goal 1 - Support North Dakota University System infrastructure needs.**

Infrastructure holds information technology systems together and allows systems to communicate with each other over a network. It includes such things as security and access control for which guidelines must be developed and updated as needed. Enterprise Architecture provides a blueprint for establishing information technology policies, procedures, and guidelines to promote effective use of information technology.

1

## **Goal 2 - Improve North Dakota University System information technology-enabled business processes and services while providing and managing resources to align with NDUS strategic goals.**

In order for the NDUS institutions to remain competitive and offer information technology support for students, faculty, and staff, including research and public service, the NDUS must provide and manage information technology resources aligned with NDUS strategic goals.

2

## **Goal 3 - Improve and enhance North Dakota University System student learning and users' focus.**

The focus of this goal is to empower student learning and development using technology by providing a near seamless environment for learning through boundless access to informational, educational and research resources, both inside and outside the classroom, for all types of students from undergraduates to the life-long learners. The NDUS encourages and supports an operational environment where characteristics of its users - student, faculty, staff, North Dakota residents, and affiliates worldwide - are identified, their needs are understood, relationships and expectations are effectively managed, and quality assurance is fostered for high-quality services and support.

3

## **Goal 4 - Improve and enhance North Dakota University System collaborative efforts.**

By working together with the State, K-12, and other constituents, the NDUS can bring new technologies to North Dakota and support existing ones. Communicating with stakeholders is an important factor and everyone must work together in making necessary information available to every administrator, faculty, staff, and student across the North Dakota University System institutions.

4