

**Software on Demand
LabMan 2017**

**University of Michigan
College of Engineering**

Don Lambert



About CAEN:

CAEN is the brand name for College of Engineering IT at the University of Michigan

CAEN's main service areas include:

- Student Computing Environment
- Instructional Technology
- Research Computing
- Web Services
- Departmental Support



Student Computing Environment (SCE)

Student Computing Environment which offers on-campus and remote access to computers, including online file storage and printing allocations, and an extensive library of engineering software. Resources are delivered in allocations as part of a computing account.

Over **11,000 students, faculty, and staff** have CAEN computer accounts.

We manage **1,300 desktop computers** with dual boot Windows and Red Hat Linux desktop

- An engineering-oriented software titles
- Network accessible home directories
- Student printing in labs
- Help desk support



2013 Software Audit

Software Licensing and Usage: University Audits recommended that CAEN provide guidance concerning...

- The various types of software licenses
- Examine proper licensing to the high-performance computing cluster (i.e. Flux)
- Have signage promoting proper software use and have a click-through prompt for acceptable use
- Provide an environment for PhD candidates and others to conduct research
- Use role-based access controls for software access



What we needed...

- To virtualize 100% of our applications
- A way to allow students to pick the proper Instruction or Research license



What we found...

- Numecent Application Jukebox
- Gartner papers comparing Application Virtualation products



Fall 2014 - Instruction & Research



For the 2014-15 academic year **we created 2 nearly identical images** with different ACLs.

This solution was **heavily dependent on AD groups and file system ACLs.**



- Roles (21)
- Course (153)
- EULA (85)
- Overrides (245)



Fall 2014 - Pilot

- Piloted Application Jukebox with Software2
- Amazon WorkSpaces Hyperloop Private Beta!
(aka Application Jukebox)




Rollout Plan

- Phase 1 - CAEN Labs Fall 2015
- Phase 2 - Central Campus Lab Winter 2016
- Phase 3 - COE Departments Fall 2016
- Phase 4 - BYOD Fall 2017






Fall 2015 - Application Jukebox

- **95% of our Applications** were virtualized
- **170+ Applications** in the S2 Hub



★  **MATLAB R2015a (64-bit) Instructional** [More Info](#)

64-bit MATLAB R2015a numerical computing and programming environment. Classroom License. [Launch](#)

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★  **MATLAB R2015a (64-bit) Research** [More Info](#)

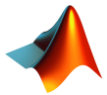
64-bit MATLAB R2015a numerical computing and programming environment. Research license. [Launch](#)

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Winter 2016 - Engineering Apps @ SITES

- Worked with ITS Sites to install **Application Jukebox** client in Angell Hall
- Delivered **17 of the top 20** Engineering Applications



Matlab*

Adams

Mathematica*

Aspen

ANSYS

NX

Chemkin

Hyperworks



Maple

Abaqus

Minitab*

Rhinoceros`

Mentor

AutoCAD*

CATIA

Comsol Multiphysics

ProModel



What we learned in 2015-2016

- Students had problems locating programs that are part of an Application Suite
 - Fluent, HFSS, Maxwell are all part of Ansys
- Local applications were not available in the S2Hub
- Solidworks has a large registry and was slow to virtualize
- Windows Registry Bloat
- Reduced effort and saved time on Windows 10 Migration Testing




Fall 2016 - Cloudpaging

- Windows 10 Enterprise 1511
- Better Descriptions
- Local Hybrid Apps
- Release Cloudpaging client to CoE Department Desktop



License details included with the Application






MATLAB R2016a (Student Instructional License)

MATLAB® is a high-level language and interactive environment for numerical computation, visualization, and programming. Using MATLAB, you can analyze data, develop algorithms, and create models and applications.

Available For: Student Instruction
Eligible Roles: Students, Faculty
Export Restriction: Yes
Additional Restrictions: On Campus use only

[More Info](#)
[Launch](#)





MATLAB R2016a (Academic Research License)

MATLAB® is a high-level language and interactive environment for numerical computation, visualization, and programming. Using MATLAB, you can analyze data, develop algorithms, and create models and applications.

Available For: Student Instruction, Student Non-commercial Research, Faculty and Staff Non-commercial Research
Eligible Users: Students, Faculty, Staff
Export Restriction: Yes

[More Info](#)
[Launch](#)



Winter 2017 - Campus Pilots

- ITS (Ann Arbor Campus Central IT)
- U-M Dearborn



What we learned in 2016-2017

- Windows 10 resolved the Registry issues and boosted performance
- Stability was greatly improved in our second year.

Only one outage that was human error.

Apps ran better

Fewer student complaints

- Students started asking for Clouding Paging for personal laptops



Fall 2017 – AppsAnywhere

- Windows 10 Enterprise 1607
- Upgrade to AppsAnywhere
 - Cloudpaging 9.0
 - Software2 Hub 2.0
- Build a new server infrastructure



Fall 2017 – AppsAnywhere

- Create a Web Store
 - ISO / DMG downloads
 - BYOD delivered by AppsAnywhere
 - Web links to no-cost apps
- Single OS Image for Student Labs and Staff desktop
 - OS Image is down to 93GB
 - Will this be our last time we do a mass reload of labs?



Next Steps

- Hosted AppsAnywhere in the Cloud
- Bring up a RemoteApp service for Mac users
- Community Application Packing
- Single AppsAnywhere instance for all of U of M



PC Team

Damon Elgas

Jim Rennell

Greg Baker

John Hufnagel

Markus Nee

Joel VanLaven

Jerry Liu



Don Lambert
University of Michigan

dlambert@umich.edu
734-647-8055

