

Badge Printing In Lenel - A Journey

Tracy Neil, tneil@Stanford.edu





Established 1885
Opened Doors 1891

9,437
graduate
students

7,083
undergrad
students

2,240
faculty
members

97% of
undergraduates
and **62%**
of graduate
students live
on campus

6,000+
externally
sponsored
research
projects

\$26.5 billion
endowment
(as of Aug. 31, 2018)

5:1 student
to faculty
ratio

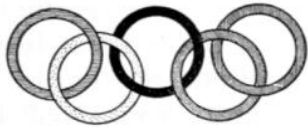
8,180
contiguous
acres

~700
major buildings
(15.3 million sq. feet)
300+ in Leland

117 National
Championships
(NCAA Division 1)

**\$1.63
billion**
total budget

7 Schools:
Business, Earth
Sciences,
Education,
Engineering,
Humanities
and Sciences,
Law, Medicine



Rio2016
27 (11 Gold)
Olympic Medals
(top university)

*Prior to Rio, Stanford athletes won a total of 243
Olympic medals (125 gold, 66 silver, and 52 bronze)*

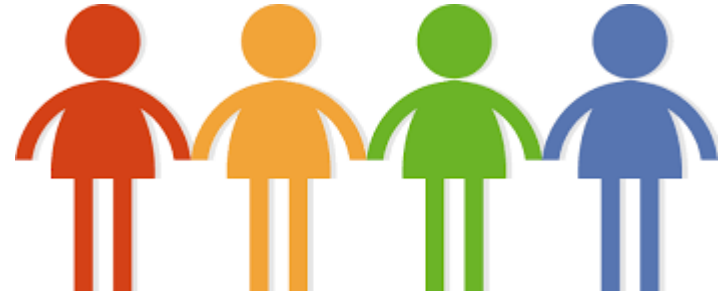
17 current Nobel laureates (31 total)
4 Pulitzer Prize winners
13 National Medal of Science recipients
2 Presidential Medal of Freedom recipients



Source: http://facts.stanford.edu/pdf/StanfordFacts_2019.pdf

Card Services at Stanford

- 8 FTE between ID Card Office and Card Services Technical Team
- 1 Director of Card Services



Lenel OnGuard 7.3.345

- 1 application server
- 8 communications servers
- 1 application server
- 1 physical DB server

3483 total locks

84,000+ active cardholders

81 segments  **LENEL:S2**
United Technologies

Transaction Point of Sale System SV&C and Meal Plans

- Used at eateries and dining halls
- Purchase of goods and services

Generates badge records and id card printing

cbord.

Stanford Campus Card Technology

Multi-tech Card

HID iCLASS Seos + Prox (RFID) contactless smartcards with magstripe and barcode



Card Swap

HID iCLASS Prox cards with iCLASS Prox + Seos cards to achieve encrypted communication with readers

Date TBD to remove Prox from cards – roughly 2021

Magstripe end of life Sept.2020

Primary use in dining halls and Point of Sale, will use Omnikey readers going forward

Prox and Barcode

Printers use prox, Libraries barcode

Readers – Goodbye Prox, Hello Seos and Bluetooth

90% of our Lenel readers are wired and most have Prox removed, with Seos and Bluetooth enabled.

New readers being activated are Seos and Bluetooth only.

Wireless readers still have Prox (not Seos) technology, testing ASSA IN120 for Seos and Bluetooth

Why change to printing in Lenel?

Real Time Access Levels

Current: badge printed in CS Gold, badge data flows to Lenel, access levels are assigned via access groups.

Two minutes or 30+ minutes if there is a lot of data processing happening.

By printing directly in Lenel, when a person gets their card, access levels are real time and wait time is eliminated. Card is ready to use at residences and administrative buildings right away.

DTC to Reverse Image Transfer

Reverse transfer image prints on a transfer film fused to the card, ideal for printing on cards with irregular surfaces. Particularly technology cards with a chip inside.

Current issue with white spots on printed cards, wasting hundreds of cards which is both costly and inefficient.

With reverse transfer printing, the card keeps its original color and quality much longer than most direct-to-card prints.

Greater DPI resolution

Our current printers have 300 dpi, and newer models have 600 dpi.

Previous Governor Jerry Brown signed Senate Bill 972 into law requiring all California Public Schools, charter, and private schools including all universities and community colleges in the state to include suicide hotline numbers and the Crisis Text Line number on one or other side of the student ID card effective July 1, 2019. Newer printers such as the Fargo 5600 have 600 dpi

Which Printers Do We Test in Lenel?

Consult Lenel's Compatibility Matrix for Printers

- work with our campus card technologies
- our version of OnGuard
- our badging workstations

Datacard printers were ruled out

- not supported in OnGuard post 6.6
- per tech support no plans to

Our Demo Picks

- **ZEBRA**
- **FARGO**

What qualities are we looking for?

- Ease of assembling and using printer
- Reliability of chip (Prox) reading from card
- Quality of the print job on the card (no more white spots!)
- Lamination quality
- Size and noise of the printer
- And of course... how to make the new printers work in Lenel!

Zebra was out early on



- ❖ Demo lamination door had trouble latching
- ❖ Demo unit couldn't laminate without covering a sensor & holding down another piece
- ❖ Won't read cards inline
- ❖ Only 300 dpi

And the winner is.... Fargo!

...but it wasn't without difficulty....

We ran into all kinds of issues and needed Lenel and Northland's help getting printer drivers to work on our workstations

Omnikey 5125 or Omnikey 5127?

In Oct 2018 Lenel only officially supported the Fargo 5000 (300 dpi) with Omnikey 5125 reader.

There is an Omnikey 5127 reader that will read the Seos chip, but we were unsuccessful at getting it to work with OnGuard.

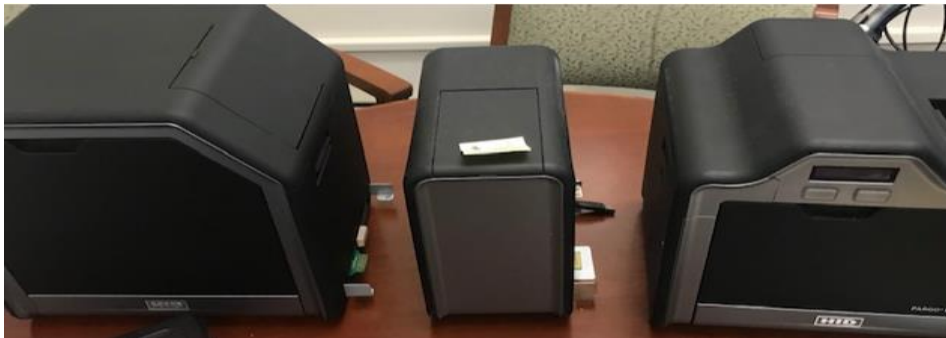
Lenel does support the 5127 for iCLASS and DESFire encoding in the current version of OnGuard, but not for reading.

Went with the 5125 reader - we'll continue to use the combo cards (Prox and Seos) and when we swap to a 5127 reader we will read the Seos chip.

Fargo HDP5000 or HDP5600?

By April 2019 Lenel stated they would support the HDP5600 Printer with the 5125 Omnikey. Provides the greater 600 dpi we are seeking to make the student cards with the multiple suicide numbers printed on the back much clearer to read.

- ❖ Quieter than our Datacard SD460s
- ❖ Awesome print quality using the reverse transfer film and dpi
- ❖ Slower print time with the flipper unit, but necessary because of the reverse transfer film needing to flip the card for dual side printing
- ❖ We can use our existing cameras
- ❖ Flexibility - we can use the 5125 Omnikey in the 5600 printers for now, 5127 in the future
- ❖ Wider dimensions – different but doable: 13 inches Height, 30 inches Length (34 with the Hopper attached) and 9 inches deep with cables plugged in



FARGO: The Bad

- ❖ What reader do we *really* have? Hidden surprise inside!
- ❖ We had the hardest time trying to get the prox number to be read in Lenel. *Many* calls with Color ID, Lenel Support and Northland.
- ❖ Workbench - take Lenel out of the equation, test the prox reader in the printer.
- ❖ Pulled the printer apart to take a closer look. Turns out we had *multiple* Omnikey readers inside in both the printer unit and the flipper unit! One of them was a 5127 and one was a 5125!
- ❖ 5127 was in the printer unit, but that version of reader does not work yet with Lenel. 5125 *does* work with Lenel, but it was in the flipper unit, and a reader in the flipper unit is not supported by Lenel.
- ❖ Swapped readers but were foiled once again by the shape of the reader itself: one of the 5125 readers was secured on a flat piece of hard plastic, and the other was secured on the diagonal.



Fargo: the Ugly



Badge Designer

- ❖ Recreate every badge design layout from scratch.

Magstripe Generation and Encoding

- ❖ Custom table in Lenel with prepopulated with unused magstripe values
- ❖ Custom Trigger inserts magstripe at time of badge printing
- ❖ Configure Card Format for Magstripe > Custom Encoding onto Track 2 specifying Database Field 'magstripe'

The screenshot shows the 'Card Format' configuration window, specifically the 'Custom Encoding' tab. The 'Track' section is set to 'Custom Field(s)'. Track 2 is selected and contains the encoding '<<'magstripe',F>>'. Below this, the 'Edit Custom Field' section shows 'Track 2; Field 1/1' with navigation buttons. The 'Database Field' dropdown is set to 'magstripe', and the 'Formatting' field contains '<<'magstripe',F>>'. Other options like 'Access Control Facility Code' and 'Access Control Card Number (Badge ID)' are visible but not selected.

New To Learn? Changes to Badge Types

One assigned Badge Template per Badge Design

Proliferation of Badge Types: From 25 to 40

Import ID from Card vs. Manual Generation

SO...MANY...MOUSECLICKS...

Previous system: With a patron (cardholder) record pulled up, it takes 2-3 mouse clicks to reissue a card; it happens all at the same time: the badge is sucked into the printer, the prox is read from the card, and the database is updated with the new badge id.

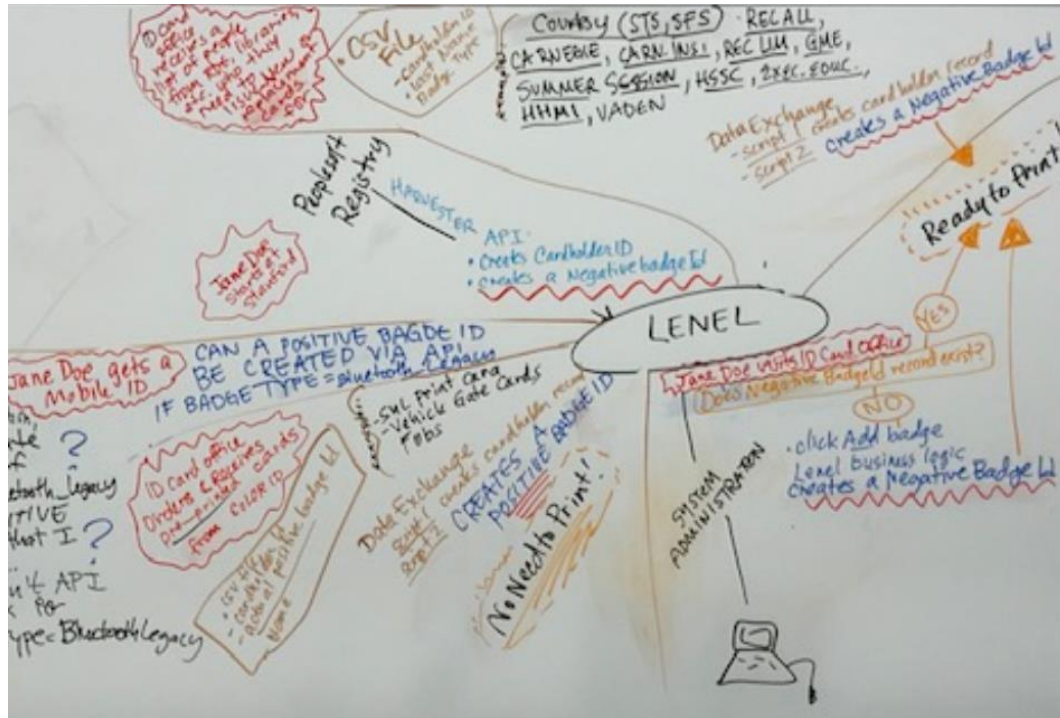


In Lene1: This is a 2-step process:

Step 1-With a cardholder record pulled up, you first must manually add a badge one at a time first (there is no bulk badge add feature). You'll be prompted for what to do with the previous badge (set to inactive, etc.), and what you want done with access levels (copy them, don't copy them), and when you're finished you'll see a temporary negative number assigned to the Badge ID field .

Step 2-Clicking Print is the second step to send the card to the printer –the prox will be read from the card and the database will be updated, replacing the negative ID with the actual prox value of the card.

Next step: Define Use Cases, Reach out for help



Reached out to HELUG list serv for others' experience with bulk printing

Engaged with Lenel Support, Northland, internal team to solve for these cases

Use Case Challenge #1



Problem:

How can we expedite the badge printing process and spare our ID Card Office from the several additional mouse-clicks required to first add a badge before printing?

Solution:

Programmatically add a badge record with a negative EMP ID value when a registry event is received for a new cardholder

Use Case Challenge #2

Problem: There's a bulk print feature, but not a bulk *add* badge feature that allows you to create multiple negative badge IDs at once.

How can we come up with a Bulk Import Solution to allow bulk import of cardholder records AND negative badge ID records so that badges can be printed in bulk, with the printers reading the prox number from the cards at print time and inserting them into the database?

Trying to replace existing badges is entirely manual and there is no way to (out of the box) add badges in bulk.

Solution: Data Exchange Script
(Greg Bulger from Northland, secret weapon)

Create a DataExchange Expression that does a Lookup against the EMP table using the SSNO field (our cardholder ID, or univ ID) to return the EMP ID, then use an Arithmetic and a Constant expression of -1 to set the badge ID to a negative EMP ID value.

DE sets script sets Deactivate date on these with 01/01/2199 (to be overwritten by ID Card Office staff).

Easy for ID Card Office stay to query newly imported cardholder records that are ready for bulk printing:

Badge < 0

Deactivate Date = 01/01/2199

Use Case Challenge #3

Problem

We print cards with a stored value and credit plan on them but no funds so that visitors outside of the Stanford community can purchase and put funds on to use printing servers. How can we bulk import cardholder records for these cards into Lenel so that we're inserting positive badge ID numbers since these are pre-printed cards that won't be getting sent to the printer?

Solution *Data Exchange Script*

(Greg Bulger from Northland, secret weapon)

Similar to the other DE only doesn't need the negative multiplier. Caveat: this ONLY works for badge types that allow for Manual Badge ID Generation

TESTING MATRIX

	Did Magstripe and Badge ID flow to CS Gold and Registry?	Barcode Scan test – same as Magstripe value?	Magstripe test on POS Device – magstripe read correctly?	Wired reader – Seos and Prox read?	Wireless reader – Seos and Prox read?	Observations on Front/Back of Card
Badge Type						
Badge Template FRONT						
Badge Template BACK						
Cardholder ID						
Last Name						
First Name						

And when you're finally ready to set a date...

- ❖ Manufacturing challenges mag encoders
- ❖ Commencement freeze
- ❖ Pick a time when everyone is available to support any issues for the next several days/weeks



Deploying to Production - Play by Play script

Close ID Card Office for a day

DB Backup, snapshots of workstations, screenshots of configurations prior to change

Configure Card Format Tab > Magstripe

Import Badge Designer templates (one at a time)

Create/Modify Badge Types needed in System Administration; there is no export/import.

<make config changes to Badge Type tab, Printing Tab, Encoding Tab, Badge ID Allocation tab ID Allocation and ID Import Source>

Import Data Exchange scripts and add to scheduler actions

Edit acs.ini file by adding HDP5600 Card Printer=Person line

Assemble all Fargo Printers: load transfer film, lamination tape, ink etc.

True up custom table with magstripe numbers in Lenel, make sure trigger is in place to populate on badge creation.

Suspend integrations processes

Power up all printers, powering up Laminate unit FIRST!

On each of 7 Windows 10 badging workstations

Install the Fargo 5600 Windows 10 64-Bit printer driver from Fargo Support site, connecting to printer when prompted

Reboot.

Install 5125 OMNIKEY driver

Reboot again.

For each workstation, configure Workstation record, specify Encoders/Scanners:

Device type = PC/SC Encoder; Credential Technology = Proximity; Location =Inline Device; Encoder= 5125 CL-0

In Printers and Devices > configure Printer Preferences for resolution quality, badge rotation, etc.

Perform a test print of each and every single Badge Type and validate all media formats:

Validate Magstripe works on AERO reader

Validate Barcode in ID Card office scanner (should read magstripe)

Validate access levels against readers

Validate data flow of magstripe and badge ID values from Lenel to other applications (registry, CS Gold)

Test bulk printing via Data Exchange.



Just for fun...



Questions?



Tracy Neil
Application Administrator
tneil@stanford.edu

Jay Kohn
Director of Card Services
jkohn@stanford.edu