PUG CHALLENGE EXCHANGE AMERICAS

Case Study: Protecting PCI Data in an Ecomm/ Catalog Environment

Tim Alten – AmeriMark Direct June 2017

Agenda

- Disclaimer
- Background
- The pieces.....

Disclamer

- While you should get some value or at least be entertained by this presentation YMMV if you apply any concepts or ideas to your environment
- This information isn't supported by AmeriMark Direct, Progress Software or anyone else

Company Overview

- AmeriMark Direct LLC is a consumer goods retailer advertising through mailed catalogs, email campaigns , Ecommerce sites and various print media.
- Primary catalog titles include Anthony Richards, Healthy Living, FeelGoodStore, TimeForMe, Beauty Boutique, Windsor Collection, Essentials and Complements.
- Products include apparel and accessories, shoes, health products, small home goods, cosmetics, jewelry, AsSeenOnTV items, etc.
- Lots of value oriented product – some higher end in certain catalogs
- Customers are mostly women – generally mature demographic
- Typical orders 2 -3 items totaling $30 - $70 dollars

Order Channels

- Today customers order via mail form (40+%) , call center (30+%) and web (20+%)
- Ecommerce sites:
- www.amerimark.com First site launched 2000/2001 covers multiple title’s products
- www.timeformecatalog.com Features TimeForMe catalog items
- www.beautyboutique.com Features BB catalog items
- www.feelgoodstore.com Features FeelGoodStore catalog items
- Some items also sold on Amazon

Presenter

- Tim Alten – IT Infrastructure Mgr / Sr Systems Analyst
- Why I might have something to say:
- Renaissance man - hands on:
- Programming 1990 – approx. 2001
- IT and Datacenter Infrastructure: 1996 – Present
- Sr DBA – 1990 - Present
- Networking and firewall guy....
- Sysadmin, OE installations and configuration
- Architecture and design....
- Responsible for PCI Compliance......

- Key concepts:
- PAN = Primary Account Number is defining piece to determine PCI applicability
- Encrypt data at rest and in transit
- Limit access to data
- Segregate data to reduce compliance scope and aid protection

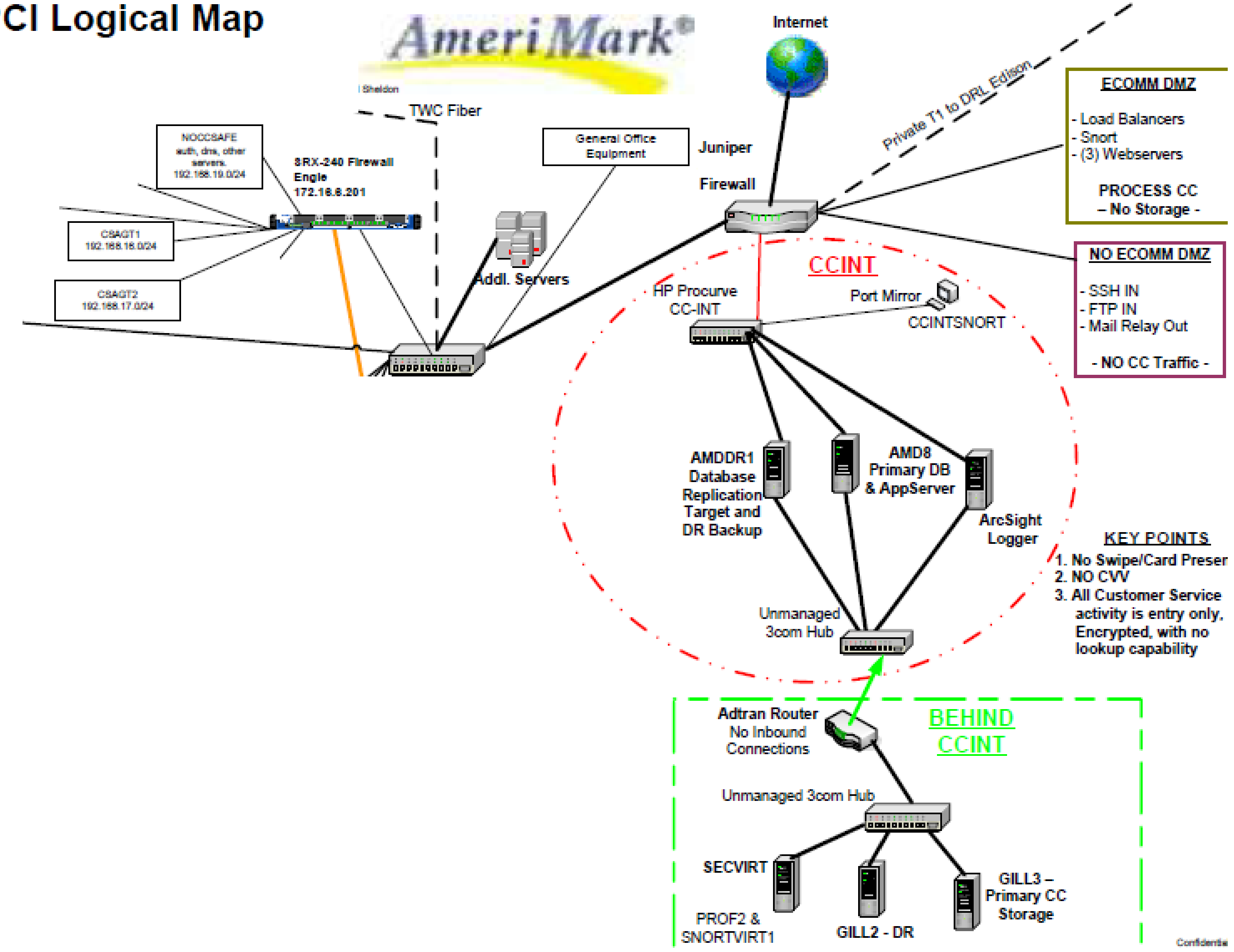
PCI Compliance – the beginning

- Begin working on 2010??
- Four levels of merchant – We are level 2 with 1 million – 6 million transactions per year on any 1 card brand – ex. VISA
- Level 1's require certified PCI audit – rest can self-assess
- Evolutionary – continuous adjustment process
- First passing self-assessment June 2011 v1.0

PCI Compliance - Initial changes / needs

- Separate CC related zones from other stuff with firewall zones to protect and minimize scope
- Open public accessible access must stop in DMZ – no direct access to internal zones
- First focus on servers and CC database storage
- Step 1 - separate PPS / PPS DR in to separate zone

PCI Logical Map



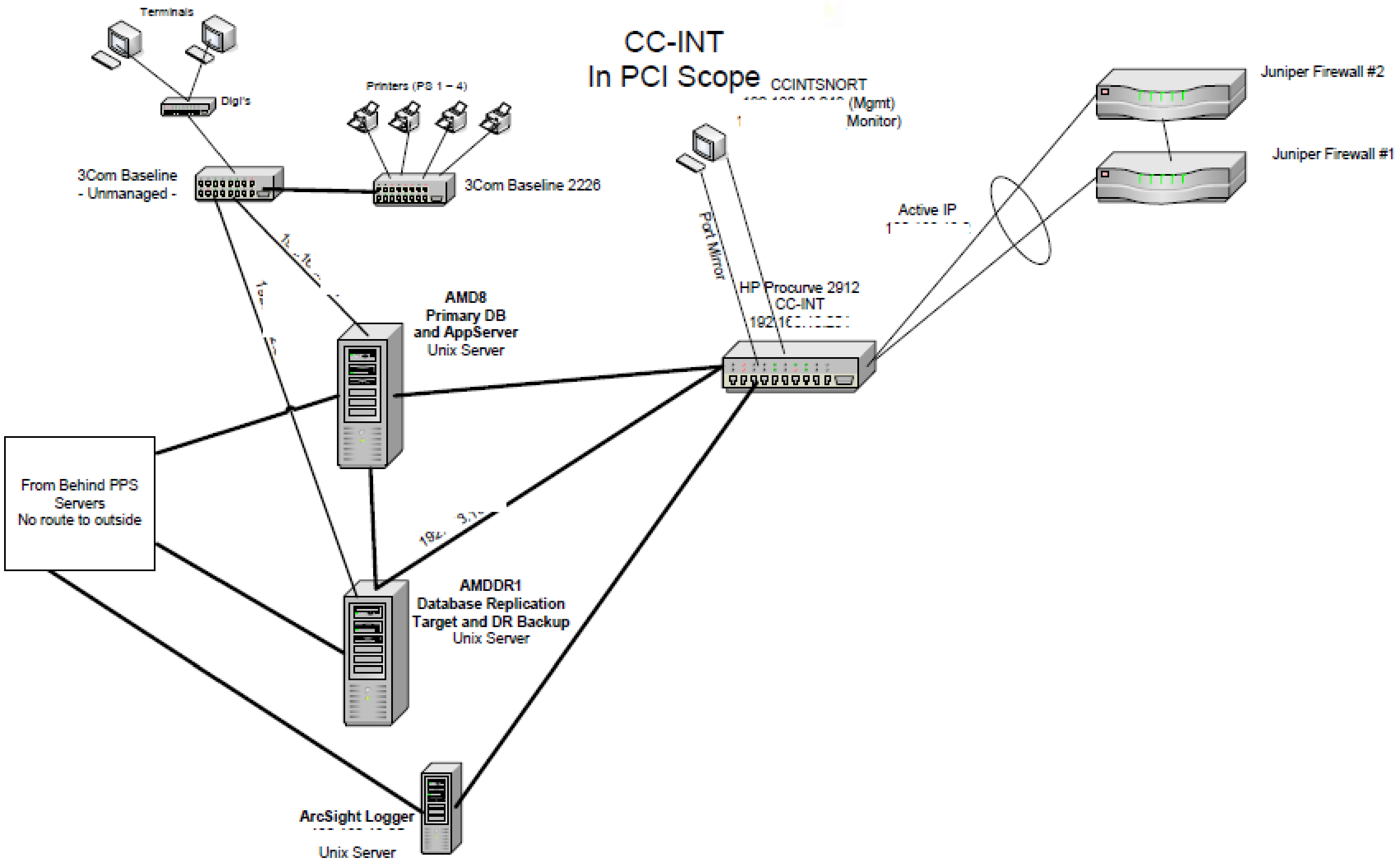
KEY POINTS

1. No Swipe/Card Preser
2. NO CVV
3. All Customer Service activity is entry only, Encrypted, with no lookup capability

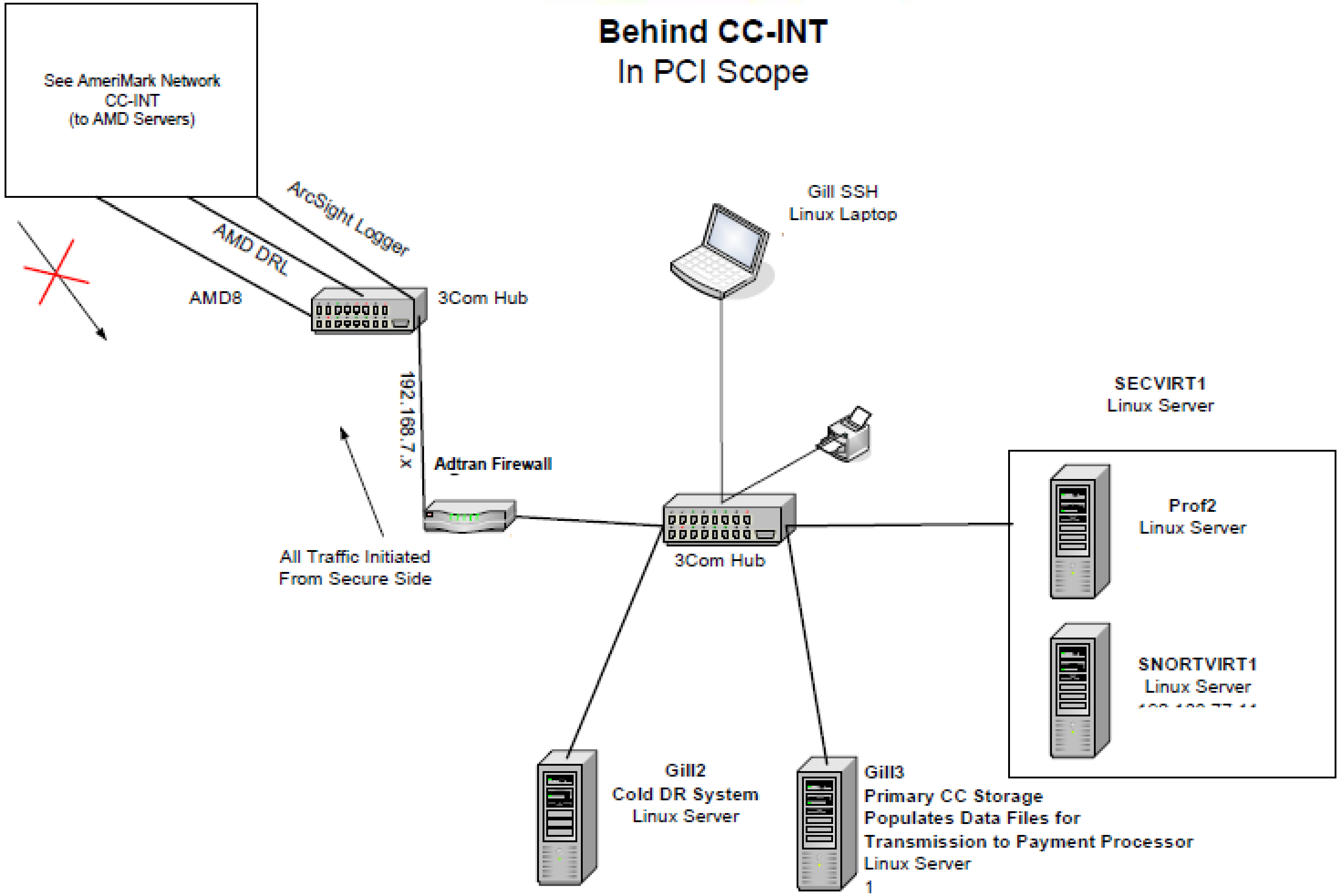
Initial PCI changes - continued

- Want to move CC out of order header table on PPS to protect it
- Also need to encrypt with industry standard encryption ex. AES
- OE DB TDE doesn’t exist yet, but language has AES encryption recently added
- Discussed ideas with Mike Jacobs PSC
- Add BehindCCINT network zone
- Install firewall that only allows traffic out from BehindCCINT
- Add network connections from PPS / PPSDR to private subnet connecting to firewall

CC-INT
In PCI Scope



Behind CC-INT
In PCI Scope



See AmeriMark Network
CC-INT
(to AMD Servers)

ArcSight Logger

AMD DRL

AMD8

3Com Hub

192.168.7.x

Adtran Firewall

All Traffic Initiated
From Secure Side

Gill SSH
Linux Laptop

3Com Hub

SECVIRT1
Linux Server

Prof2
Linux Server

SNORTVIRT1
Linux Server

Gill2
Cold DR System
Linux Server

Gill3
Primary CC Storage
Populates Data Files for
Transmission to Payment Processor
Linux Server
1

Initial PCI changes - continued

- Add Linux system with OE databases – GILL
- data database has table with AES encrypted CC # , tie-id ex. order #, shopcart # , encryption key id - users include IT Operations
- key database has table with key-id, AES encrypted encryption keys
- encryption keys are encrypted using human entered passphrase as encryption key
- human passphrase is split knowledge – 3 IT staff know 1st half, 3 IT staff know 2nd half

Initial PCI changes - continued

- On PPS create new database for momentary CC storage – limited users – restricted OS security
- momentaryCC db table has AES encrypted CC and tie-id ex. order-no
- set up appservers to accept CC# and tie-id and store in records in momentaryCC db table
- change local character OE to pass entered CC to Appserver
- change Ecomm web servers to pass CC over to SSL encrypted Appserver
- batch program on GILL connects to databases there locally and client-server SSL to momentaryCC db on PPS – continuously scans for momentary CC records, pulls data over to GILL and deletes momentary CC record
- momentary CC record AES encrypted with hard-coded keys known to Appserver programs and GILL batch programs

Initial PCI changes - continued

- Result – CC are immediately separated from customer info making tying data together way more difficult
- No network connectivity in to long term storage system – firewall prevents incoming traffic
- New encryption keys can be created periodically and instituted for proper key rotation
- Use database trigger to create audit record to record when long term record is read, by what program and user

Initial PCI changes - continued

- How to use CC data ?
- PPS creates bank file for batch processing with sanitized XXXX1234 version of credit card, customer information and tie-id ex. order #
- Computer Operations logs on to GILL system, runs scripts/programs to pull over bank file, read file look up CC using order # , rewrite file with full CC# , encrypt file with bank’s public GPG/PGP key and push file back over to PPS
- Computer Operations logs on to PPS and SFTPs file using script to bank, script removes populated bank file from PPS
- For answers back from bank file is GPG/PGP encrypted with our public keys – file is pulled to GILL – decrypted with our private key – processed to sanitize CC# - pushed back to PPS
- lots of use of SUDO and shell scripts !

Initial PCI changes - continued

- All employees get ID badges – Computer room access controlled by ID badge swipe
- Employees handling CC need background check, IT background + credit check
- Multiple video cameras monitor computer room, recordings not under IT control
- Added SNORT listeners in DMZ, CCINT, BehindCCINT to meet requirements for IDS
- Use Tripwire Enterprise Server to monitor select files on PPS, Webservers, Development systems, etc. for FIM (File Integrity Management)
- Need a SIEM to collect logs, automate alerts and provide clean store for 1 yr retention – Add Arcsight logger with PCI module
- Send logs from PCI systems, firewalls, switches, etc. to Arcsight
- Do quarterly Nessus scans with Nessus Professional ($1200/yr -1 laptop) on all PCI zones

Initial PCI changes - continued

- Have McAfee Secure perform quarterly ASV scans on external IPs for security issues
- Daily McAfee scans also find input sanitization issues, cross-site scripting, etc.
- Hire local firm – Hurricane Labs to do periodic internal and external pen testing
- If pen testers don’t find creative, meaningful issues GET NEW PEN TESTERS !

Let’s look at some code

- ……………………….

Other tricks

- For command line _progress startups want to hide password information

- stty –echo   ## turn off echo
- read db1pass
- stty echo ## turn echo back on
- _progress –db db1 –U $db1user –P $db1pass –p sec-save.p

- ps aux |grep _prog
- _progress –db db1 –U tim –P   -p sec-save.p

2013 – You thought PCI was bad before......

- MasterCard requires Level 2 merchants have full audit in addition to Level 1
- PCI versions now on V2.0 with more requirements
- AMK hires Halock Security to help with formal risk assessment and do PCI audit – cost approx. $40,000
- Lots of work on more formal policies, standards, procedures
- Tighten up all over.........

2013,2014 More PCI changes

- Protect Order Entry / Customer Service reps with network segregation behind firewall
- Create NOCCSAFE zone for key control/auth servers ex. DNS, NTP, AD for CS, WSUS patch server, Sophos AV server

2015 – More PCI and security turmoil

- V3.0 spec out – LOTS more documentation required
- SSL3 not safe – Implement OE 11.3.3HF013 internally on PCI systems and switch internal OE encrypted communications to TLS1.0 – no more SSLv3
- TLS1.0 needs to be replaced by TLS1.2 soon

2016 Finally OE 11.6

- Switch internal OE TLS connections to TLS1.2 only
- Better TLS1.2 encryption with SHA256 needs better certificate
- Generate certs on Linux and move to AIX – AIX openssl did not make format needed by OE
- Also:
- Revise Apache web servers to use TLS1.2 only instead of TLS 1.0
- Late 2016 begin replacing EOL Arcsight logger with Splunk solution

2017 Need Real Time Authorization

- Now need to authorize CC when order is received
- Use HTTPS call to payment processor
- Hold CC and CCV code in memory until auth attempt completed
- NEVER WRITE CCV CODE TO DISK – ONLY CC CAN BE STORED
- Web customers can have stored CC on file in long term
- Set up appserver on long term storage and make calls to it from PPS to retrieve CC and make authorization call

Thanks for attending !

- Hope you enjoyed !
- Questions ??

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