



California
DEPARTMENT OF TECHNOLOGY
Office of Technology Services

Quarterly Network Forum

May 17, 2016



Opening and Introduction

Barbara Garrett
Deputy Director,

Statewide Telecommunications and Network Division
(STND)

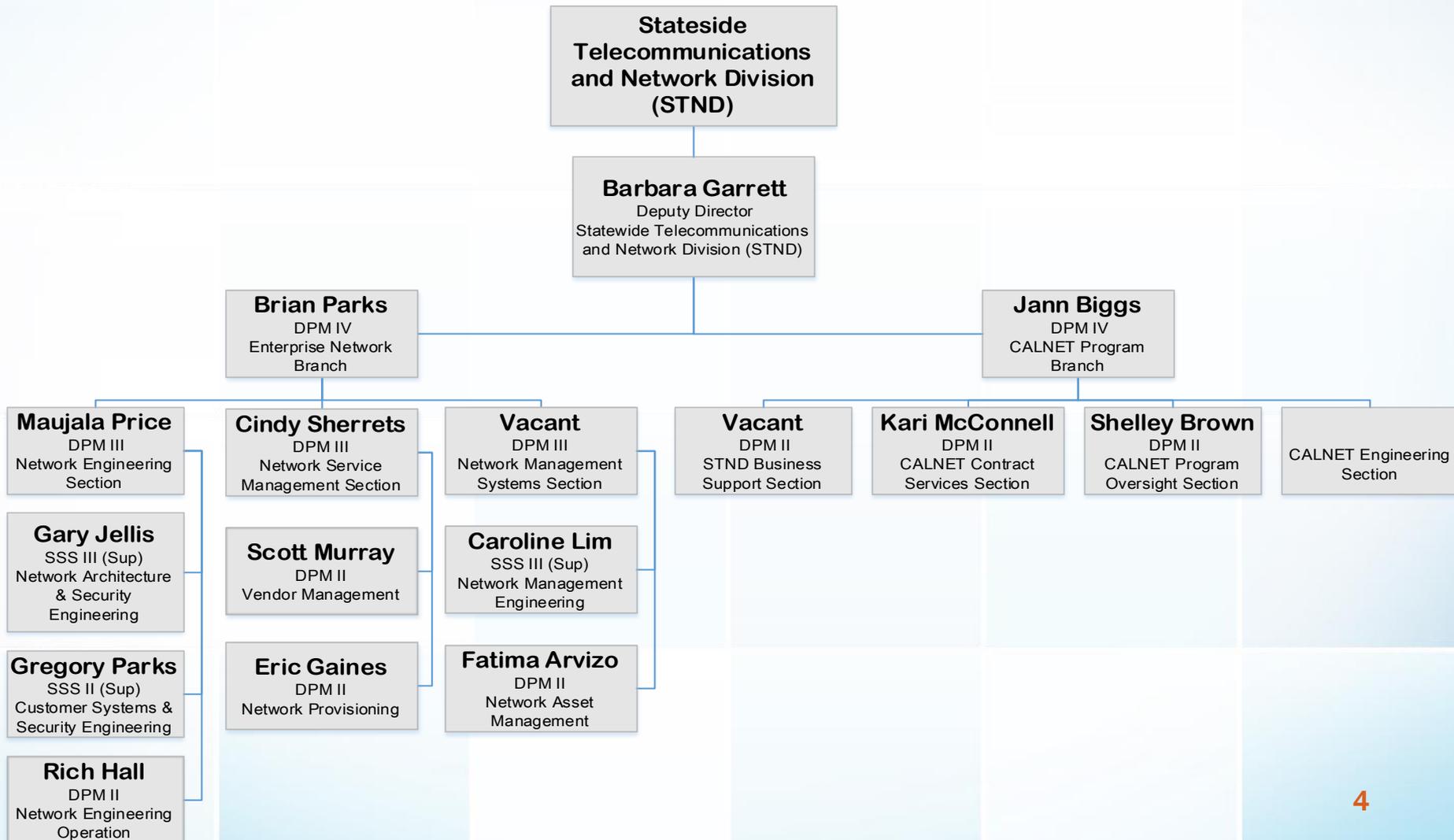


Agenda

9:00 - 9:05 AM	Opening and Introductions Barbara Garrett	STND Deputy Director
9:05 - 9:10 AM	Information Sharing Brian Parks	Branch Chief, Enterprise Network Branch
9:10 - 9:25 AM	New Network Infrastructure Changes Rodrigo Munguia Rick Bieniek Eric Ehnisz	Enterprise Network Branch Network Architecture & Security Engineering Unit Customer Systems & Security Engineering Unit
9:25 - 9:40 AM	Updates on Infrastructure Improvements Greg Soria AbdulMalik AbdulRahman-Wells Bryan Rusk	Engineering Division /Windows Projects Unit Network Architecture & Security Engineering Unit Network Architecture & Security Engineering Unit
9:40 - 10:00 AM	BREAK (20 minutes)	
10:00 - 10:20 AM	CGEN Updates John Sweet Scott Murray	Network Service Management Section Vendor Management Unit
10:20 - 10:30 AM	CALNET Matt Fairbairn	CALNET Engineering Section
10:30 - 11:00 AM	Q & A / Closing Barbara Garrett	STND Deputy Director



STND Org Chart





Information Sharing

Brian Parks
Branch Chief
Enterprise Network Branch



CENIC

- Corporation for Education Network Initiatives in California
 - Operates California Research and Education Network (CaREN)
 - Hi Capacity Network
 - K thorough 12th grade
 - Universities
 - Public Libraries
 - Industry research organizations





CENIC & Department of Technology

- CENIC and CDT have agreed to connect CaREN and CGEN
 - Enable educational institutions to access series at CDT
 - Facilitate shared services on the network
 - More customers leverage infrastructure, reduce costs
 - Currently working with CENIC to establish IAA





CENIC Connectivity

- **Fiber connectivity to CENIC POP in Sacramento**
 - City of Sacramento fiber
 - IAA with the City signed April 18
 - Expand fiber connectivity downtown
 - CDT will provide the City backup ISP services
- **Implementation**
 - City of Sacramento will extend fiber to CENIC POP
 - CENIC and CDT will establish physical connectivity
 - Target date not yet established – expected this summer





Security

- **Restricted route advertisements**
 - Only authorized CENIC entities routes will be advertised
 - Only authorized CDT destination routes will be shared
- **Access Control Lists (ACL)**
 - Restrict access to allow only authorized sources to communicate with authorized destinations
- **Intrusion Prevention System**
 - All inbound traffic will be inspected by IPS
- **Firewalls**
 - Traffic will traverse one or more firewalls before reaching destination





WAN Router Refresh

Rodrigo Munguia
STND



Hardware Refresh

- **Distribution Router**
 - End of Life
 - High density 10GB
 - 40GB and 100GB capable
- **Stages**
 - **WAN Distribution Routers**
 - Scheduled for 3rd Q 2016
 - **Data Center Distribution Routers**
 - Scheduled 4th Q 2016
 - Internet Routers
 - Core Routers





FRS Sniffers

For the Fiber Ring Service

Rick Bieniek

Network Architecture & Security Engineering Unit





What is a Sniffer?

- A sniffer can be a piece of software or hardware that can capture and log traffic that passes over a wire or a fiber connection.
- OTech uses sniffers extensively to troubleshoot network/application issues.
- 16TB's of storage
- We currently have 14 Netscout 10gig sniffers, 56 total ports



IP Hound Dog



FRS Sniffers

- OTech recently acquired a new sniffer to support FRS.
- Allows us to quickly identify network/application issues by drilling down inside the packet.

The screenshot displays the nGeniusONE network sniffer interface. The top section shows a list of captured packets with columns for Packet, Absolute Time, Delta Time, Size, Source, Destination, Interpretation, and Status. The bottom section provides a detailed view of a selected packet, showing its structure and raw data. A cartoon dog character is overlaid on the detailed view.

Packet	Absolute Time	Delta Time	Size	Source	Destination	Interpretation	Status
1	04/21/18 08:18:45.488.045.110 AM	0.000.000.000	1442	[REDACTED]	[REDACTED]	RTMP: Unlabeled Data	ACK
2	04/21/18 08:18:45.488.046.290 AM	0.000.001.170	1442	[REDACTED]	[REDACTED]	RTMP: Unlabeled Data	ACK
3	04/21/18 08:18:45.488.046.350 AM	0.000.000.270	88	[REDACTED]	[REDACTED]	TCP: 5=>44596 [D=443/HTTFS] LEN=0 SEQ=42112138 ACK=272479866 Win=6480	ACK
4	04/21/18 08:18:45.488.047.460 AM	0.000.001.110	1962	[REDACTED]	[REDACTED]	HTTP: Continuation of existing frame: 1288 Bytes of data	ACK
5	04/21/18 08:18:45.488.047.530 AM	0.000.000.270	88	[REDACTED]	[REDACTED]	TCP: 5=>12844 [D=0/WWW/HTTHTTP] LEN=0 FIN SEQ=2139634128 ACK=71148866 Win=0	ACKFIN
6	04/21/18 08:18:45.488.048.630 AM	0.000.001.500	1962	[REDACTED]	[REDACTED]	SSL: Encrypted Payload	ACK
7	04/21/18 08:18:45.490.061.290 AM	0.000.002.600	1522	[REDACTED]	[REDACTED]	SSL: Encrypted Payload	ACK
8	04/21/18 08:18:45.490.062.390 AM	0.000.001.110	1962	[REDACTED]	[REDACTED]	SSL: Encrypted Payload	ACK
9	04/21/18 08:18:45.490.062.500 AM	0.000.001.110	1962	[REDACTED]	[REDACTED]	SSL: Encrypted Payload	ACK
10	04/21/18 08:18:45.490.066.850 AM	0.000.002.350	1902	[REDACTED]	[REDACTED]	ESP: SPI=129003069	-
11	04/21/18 08:18:45.490.066.040 AM	0.000.000.190	222	[REDACTED]	[REDACTED]	ESP: SPI=129003069	-
12	04/21/18 08:18:45.490.067.540 AM	0.000.001.500	1478	[REDACTED]	[REDACTED]	HTTP: Continuation of existing frame: 1387 Bytes of data	ACK

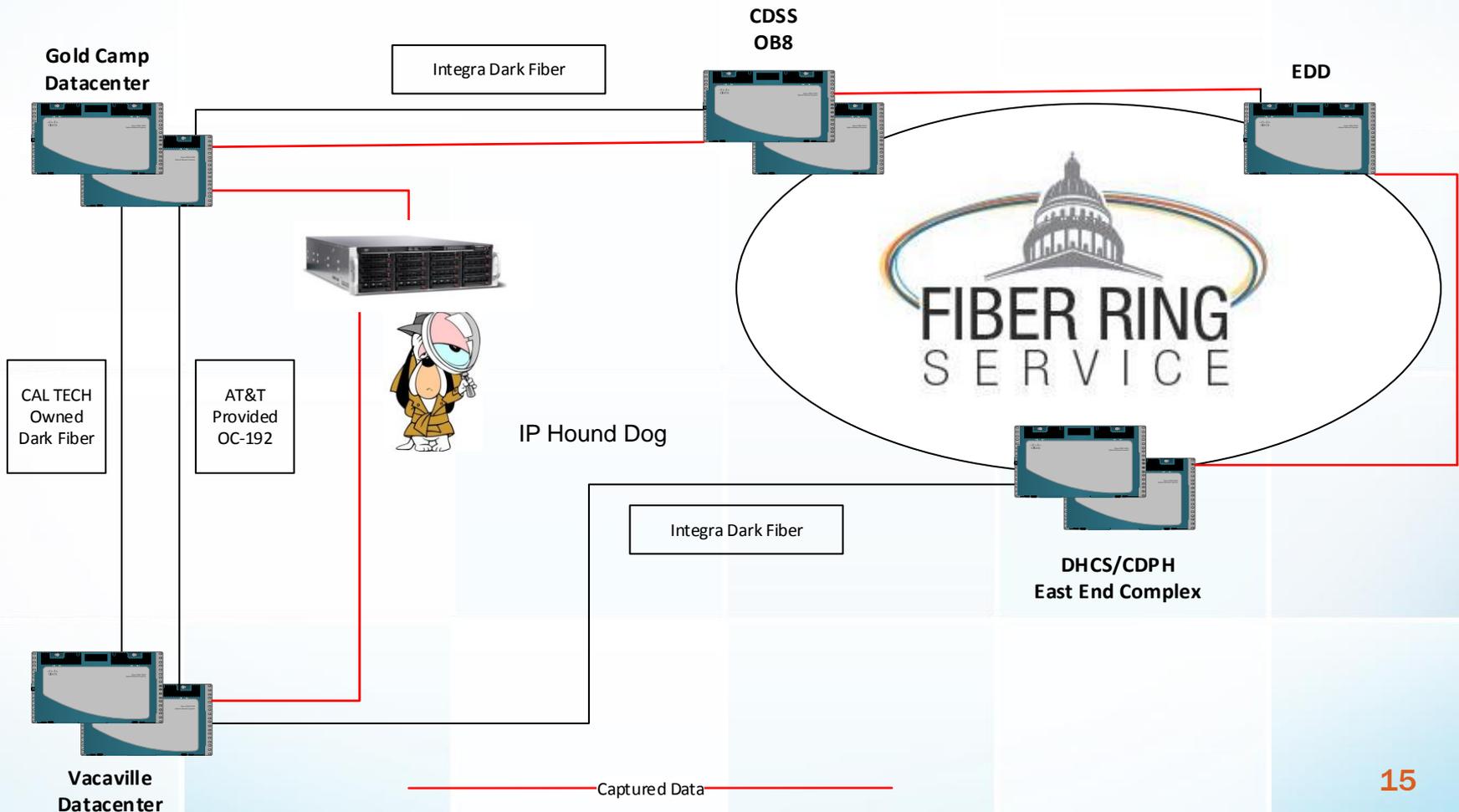
Sequence number = 175889029
Next expected Seq number = 175889037
ACKnowledgment number = 1772632818
Data offset = 32 bytes (8 bits)
Reserved bits = Reserved For Future Use (3 bits)
ECN-Nonce-Sum = 0 (2 bits)
Flags = 0x00
...C... = (Congestion window reduced (CWR) NOT SET)
...E... = (ECN Echo NOT SET)
...U... = (No urgent pointer)
...A... = ACKnowledgment
...P... = (No push)
...R... = (No reset)
...O... = (No SYN)
...F... = (No FIN)
Window size = 79
Checksum = 0x785 (offset)





FRS Sniffers

- Capture points will include Network TAP's and SPAN ports.





FRS Sniffers

Packet	Absolute Time	Delta Time	Size	Source	Destination	Interpretation	Status
1	04/21/16 10:12:47.262.526.500 AM	0.000.000.000	78	[REDACTED]	[REDACTED]	TCP: S=2212 D=80(www/www-www/http/http) LEN=0 SYN SEQ=363263497 WIN=14600	SYN
2	04/21/16 10:12:47.302.548.630 AM	0.020.022.130	78	[REDACTED]	[REDACTED]	TCP: S=80(www/www-www/http/http) D=2212 LEN=0 SYN SEQ=2503522941 ACK=3632634973 WIN=6792	ACK/SYN
3	04/21/16 10:12:47.303.522.410 AM	0.000.973.780	70	[REDACTED]	[REDACTED]	TCP: S=2212 D=80(www/www-www/http/http) LEN=0 SEQ=3632634973 ACK=2503522942 WIN=7=14720	ACK
4	04/21/16 10:12:51.302.416.100 AM	3.988.893.680	78	[REDACTED]	[REDACTED]	TCP: S=80(www/www-www/http/http) D=2212 LEN=0 SYN SEQ=2503522941 ACK=3632634973 WIN=6792	ACK/SYN
5	04/21/16 10:12:51.303.225.700 AM	0.000.809.600	70	[REDACTED]	[REDACTED]	TCP: S=2212 D=80(www/www-www/http/http) LEN=0 SEQ=3632634973 ACK=2503522942 WIN=115	ACK
6	04/21/16 10:13:17.842.241.130 AM	26.539.015.430	700	[REDACTED]	[REDACTED]	HTTP: C: POST (/HTTP/1.1)	ACK/PSH
7	04/21/16 10:13:17.860.297.840 AM	0.008.056.710	79	[REDACTED]	[REDACTED]	HTTP: Continuation of frame 6 (2/2): 9 Bytes of data	ACK/PSH
8	04/21/16 10:13:17.864.978.740 AM	0.014.880.900	70	[REDACTED]	[REDACTED]	TCP: S=80(www/www-www/http/http) D=2212 LEN=0 SEQ=2503522942 ACK=3632635633 WIN=7=7168	ACK
9	04/21/16 10:13:17.871.519.640 AM	0.006.541.100	70	[REDACTED]	[REDACTED]	TCP: S=80(www/www-www/http/http) D=2212 LEN=0 SEQ=2503522942 ACK=3632635642 WIN=7=7168	ACK
10	04/21/16 10:13:18.112.575.370 AM	0.241.055.530	1358	[REDACTED]	[REDACTED]	HTTP: R: HTTP/1.1 Status=OK	ACK
11	04/21/16 10:13:18.113.025.860 AM	0.000.450.510	1358	[REDACTED]	[REDACTED]	HTTP: Continuation of frame 10 (2/6): 1288 Bytes of data	ACK
12	04/21/16 10:13:18.114.254.310 AM	0.001.228.430	1358	[REDACTED]	[REDACTED]	HTTP: Continuation of frame 10 (3/6): 1288 Bytes of data	ACK
13	04/21/16 10:13:18.118.051.450 AM	0.003.797.140	70	[REDACTED]	[REDACTED]	TCP: S=2212 D=80(www/www-www/http/http) LEN=0 SEQ=3632635642 ACK=2503524230 WIN=137	ACK
14	04/21/16 10:13:18.118.052.180 AM	0.000.000.730	70	[REDACTED]	[REDACTED]	TCP: S=2212 D=80(www/www-www/http/http) LEN=0 SEQ=3632635642 ACK=2503525518 WIN=160	ACK
15	04/21/16 10:13:18.118.199.170 AM	0.000.146.990	70	[REDACTED]	[REDACTED]	TCP: S=2212 D=80(www/www-www/http/http) LEN=0 SEQ=3632635642 ACK=2503526806 WIN=182	ACK
16	04/21/16 10:13:18.159.200.180 AM	0.041.001.010	1358	[REDACTED]	[REDACTED]	HTTP: Continuation of frame 10 (4/6): 1288 Bytes of data	ACK
17	04/21/16 10:13:18.159.459.260 AM	0.000.259.060	1358	[REDACTED]	[REDACTED]	HTTP: Continuation of frame 10 (5/6): 1288 Bytes of data	ACK
18	04/21/16 10:13:18.159.869.500 AM	0.000.410.240	1358	[REDACTED]	[REDACTED]	HTTP: Continuation of frame 10 (6/6): 1288 Bytes of data	ACK

PACKET: #5 arrived at 2016/04/21 17:12:51.303.225.700(UTC); Length = 70 bytes; Captured = 70 bytes.

ETHERNET: [REDACTED], EtherType=0x0800

IP: [REDACTED]

```

TCP: --- TCP ---
  Source port      = [REDACTED]
  Destination port = 80 (www/www-http/http)
  Sequence number  = 3632634973
  Next expected Seq number = 3632634973
  Acknowledgment number = 2503522942
  Data offset      = 32 bytes (4 bits)
  Reserved Bits:   = Reserved for Future Use (3 bits)
  ECN Nonce-Sum:   = 0 (1 bit)
  Flags            = 0x10
  Window size      = 115
  Checksum         = 0xC663 (correct)
  Urgent pointer   = 0
  Options

```

```

0000  00 30 08 FF 21 51 00 18 00 8D F1 80 08 00 41 00  ..0p0...1A4..6.
0010  00 34 98 F0 4D 00 3A 04 88 08 96 80 04 00 A9 80  ..4D8..1..102..81
0020  CE AD 08 44 00 10 D9 81 9C 1D 95 38 EA 7E 80 10  .!.*.PD.8].87*-E.
0030  00 03 C8 E3 00 00 01 03 08 04 23 48 AE A3 8B 87  .88E3.....*HF6D.
0040  F4 38 F4 54 20 62

```

EBCDC



Network Firewall Security Enhancements

**Eric Ehnisz, Network Engineer
Customer Systems & Security
Engineering Unit**



Firewall Upgrade & Consolidation

■ Process Used in Decision

- Gather Requirements
- Ensure to minimize customer impact during upgrade process
- Lab test multiple vendors to ensure that requirements are met



■ Customer and Service Units Assistance During Deployment

- Testing may involve customer and Service Units
- OTech Network Engineer assist with all testing
- Continued support after migration



Enterprise Firewall Upgrade & Consolidation

- Firewall Upgrades
- Physical Upgrade Reduces Footprint as Firewalls are Virtualized
- Software Upgrade with deployment





Enterprise Firewall Upgrade & Consolidation

- Why are we doing this?
 - Not Reliant on Proprietary Routing Protocols where used
 - Faster Remediation Times for software vulnerabilities
 - Reduced Impact to customers for code upgrade
 - Optimizing performance and throughput





Customer Firewalls Upgrade & Potential New Services

- **Upgrading of CDT Managed Customer Edge Firewalls**
 - These firewalls will receive upgrades to enable us to provide new services
 - Services under review
 - URL Filtering
 - Malware Detection and Mitigation
 - VPN Services
 - Benefit of these upgrades with enhanced services will result in:
 - A Lower Cost of Ownership
 - Enhanced Perimeter Security
 - Enhanced Security Protection





Migration of Microsoft ISA Proxy Services

Greg Soria

Windows Services Branch

Engineering Division



Migration of Microsoft ISA Proxy Services to OTech Server Load Balancing and Reverse Proxy Service

- **What is the Server Load Balancing & Reverse Proxy Service?**
 - New web application firewall security service
 - Protect against DDoS attacks, zero-day attacks and application vulnerabilities
 - Create specific policies for each environment
 - Provide weekly reports of blocked attacks

- **What can this extra service provide?**
 - Protects attacks against all web applications
 - Guard data against information leakage
 - Detects and mitigates Layer 7 attacks
 - Differentiating between humans and bots

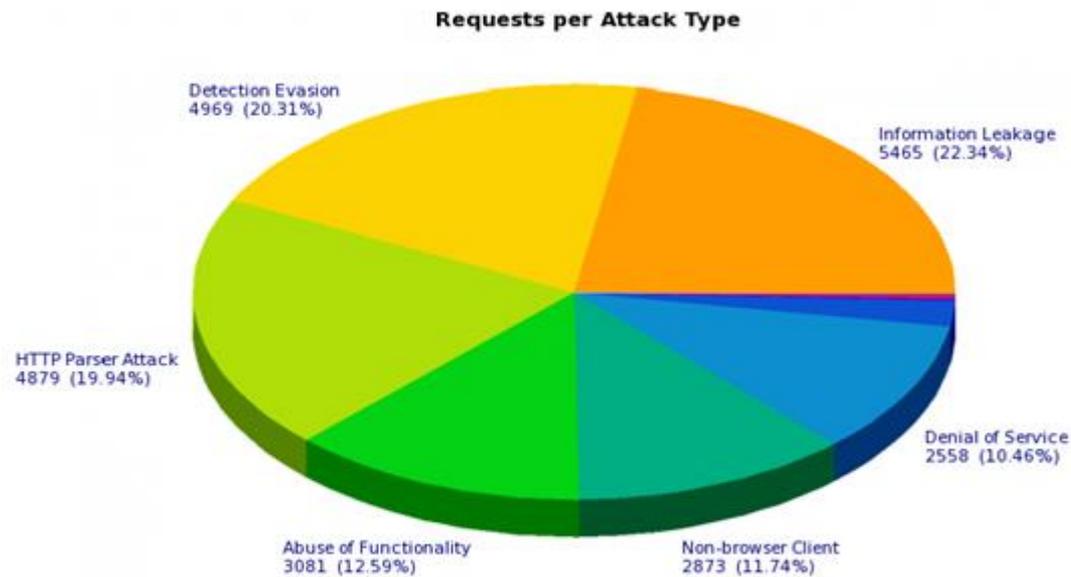




Migration of Microsoft ISA Proxy Services to OTech Server Load Balancing and Reverse Proxy Service

ASM Report for blocked attacks against a customer

Attack Type	Requests
1 Web Scraping	78020
2 Information Leakage	5465
3 Detection Evasion	4969
4 HTTP Parser Attack	4879
5 Abuse of Functionality	3081
6 Non browser Client	2873
7 Denial of Service	2558
8 Path Traversal	473
9 Command Execution	44
10 Cross Site Scripting (XSS)	38
11 SQL Injection	36
12 Predictable Resource Location	28
13 Other Application Attacks	8
14 Injection Attempt	5
15 Server Side Code Injection	3
16 Trojan/Backdoor/Spyware	2
17 Vulnerability Scan	1
18 Total Attacks count for all requests	102483





OTech Enterprise Wireless Network

AbdulMalik AbdulRahman-Wells

Network Architecture & Security Engineering Unit

STND



Sponsor Portal

- **3 New SSIDs for Internet Access**
 - CDT Guest – Visitors, Contractors, Staff Augmentations
 - XXXXXX – OTech Employees internet access
 - XXXXXX – Used by request for large engagements (more than 30 guests)
- **All OTech employees will be able to sponsor visitors by going to a LAN accessible website**
 - Sponsors have the capability to manage only the guests they sponsored.



Sponsor Portal



Sponsor Portal

Sign On

Use the Sponsor portal to manage guest accounts. Sign on with your username and password after verifying that you agree to the terms and conditions, if required.

Username:

Password:

Sign On

[Help](#)



Sponsor Portal cont..

- Information for each guest must be entered into portal such as:
 - First and Last Name
 - Company Name
 - Duration on site (credentials will automatically expire)
 - Username
- Types of Users
 - Contractor 90-days
 - Daily 5-days
 - Weekly 14-days



Sponsor Portal cont.



Sponsor Portal

Create Accounts

Manage Accounts (1)

Pending Accounts (0)

Notices (0)

Guest type:

Weekly (default) ▾
Contractor-90 days
Daily (default)
Weekly (default)

Guest Information

Known

Random

Import

First name:

Last name:

Email address:

Phone number:

Company:

Person being visited (email):

Reason for visit:

Group tag:

Language:

Access Information

Duration:*

5 Days (Maximum: 14)

From Date (yyyy-mm-dd) *

2016-05-06

From Time *

13:06

To Date (yyyy-mm-dd) *

2016-05-10

To Time *

13:06

Create



Sponsor Portal cont.

- After completion of the Portal guest registration, a username and random password will be generated.
- This must be printed or emailed to the guest user before they can access the network
- Guest User's will have to accept the AUP (Acceptable User Policy) at sign on.
 - Further authentication will be suspended until expiration of the guest account.



Fiber Ring Service (FRS)

Bryan Rusk

Network Engineer

Network Engineering Unit



FRS – Service Offerings



- Now offered as a primary service
- Circuit speeds from 10 Mb to 10 Gb
- Multi-service offering
 - Dedicated layer 1 (DWDM)
 - Layer 2 (Ethernet, E-line, etc.)
 - Layer 3 (MPLS, IP, all routing protocols supported)



FRS Expansion

- **New DGS fiber sharing provides connectivity to 21 buildings in downtown Sacramento**
 - **Additional 10 Gig ring added to the FRS**
 - **Physical, logical, hardware, and path redundancy for all circuits**
- **Partnership with the City of Sacramento will expand the FRS reach to additional areas**
- **Partnership with CENIC will provide connectivity to educational institutions**





FRS Statistics

- 99.999% availability
- 27 fiber connected buildings
- 20 Departments and Agencies
- To determine eligibility or to order service, please contact your CDD representative





Break

(20 minutes)



CGEN Update

John Sweet

Network Service Management Section

STND



What's Going on in CGEN



- CGEN vendor managed circuits consist of offerings from AT&T, Integra, NWN, and Verizon.
 - CenturyLink has fiber in Gold Camp and can be activated whenever customers may need it.
- Migrations over but the volume is still high
 - Moves, Adds, Deletes
 - Right-sizing (increasing and decreasing bandwidth)
 - Fine-tuning



Customer Read-Only Access

- **Ping and Read-Only SNMP**
 - OTech Network Management pings and polls CGEN devices
 - CGEN customers can have the same visibility, if needed, with their tools.
- **OTech staff can SSH into AT&T and Verizon managed routers**
 - Efforts are being made to enable this visibility with Integra and NWN





Customer Read-Only Access-cont.

We have heard you, customers need more visibility!



- **CGEN Customer SSH access to CGEN devices**
 - **Verizon** – available now (SSH through a “jump server” and some show commands through the Verizon Enterprise Center Portal)
 - **AT&T** – jump server established as a proof of concept. Currently being evaluated by one customer.
 - **Integra and NWN** – efforts underway, stay tuned to next forum for updates



AT&T Switched Ethernet (ASE)

- AT&T OPTEMAN (OEM) has been the Metro Ethernet offering from AT&T for over 15 years now. Big news – it is being phased out in favor of AT&T Switched Ethernet (ASE)
(No forced migration, no end of life date)

- OPTEWAN infrastructure is difficult to maintain and expensive
 - OPTEWAN transport fee is increasing July 1, 2016





AT&T Switched Ethernet (ASE)

- AT&T pricing for ASE is lower than the same offering for OEM.
- ASE is interLATA (can go long distance without the OPTEWAN collector ports)



AT&T Switched Ethernet (ASE)-cont.

- Cost comparison snapshot (CGEN pricing, not CalNet raw rate)

CIR	OPTEMAN	AT&T Switched Ethernet	% Difference	Monthly Savings
10 Mbps	\$1,789.27	\$1,298.27	-27%	\$491.00
20 Mbps	\$2,330.29	\$1,674.70	-28%	\$655.59
50 Mbps	\$3,461.78	\$2,600.23	-25%	\$861.55
100 Mbps	\$4,715.01	\$3,660.34	-22%	\$1,054.67
150 Mbps	\$6,325.00	\$4,997.31	-21%	\$1,327.69
250 Mbps	\$6,547.88	\$5,076.62	-22%	\$1,471.26
500 Mbps	\$6,653.38	\$5,198.65	-22%	\$1,454.73



CGEN Vendor Management Unit

Scott Murray, DPM II

Manager, Vendor Management Unit

Network Service Management Section



CGEN Vendor Management Unit

Mission:

Monitor and track vendor performance, escalate and coordinate service disruptions or performance issues, and develop strong vendor working relationships that provide a quality WAN connectivity service experience to the data center and OTech's CGEN customers.



CGEN Vendor Management Unit

- **Bi-monthly Vendor Technical Meetings**
 - Facilitate meetings with Enterprise Network Branch technical staff or management and vendor technical support staff or management.
 - Collaborate on service solutions or commitments
 - Emerging technologies and design enhancements
 - Lower customer costs.
 - Improve communication with the OTech Service desk.
 - Discuss and coordinate such topics as:
 - Secure Vendor Portals
 - Vendor Router Configs
 - OTech Access to Vendor Managed Routers
 - Out of Band Management
 - Vendor Maintenance Notifications
 - Network Management Vendor Requirements
 - Vendor Provided Training



CGEN Vendor Management Unit

- **Bi-weekly Vendor Service Provisioning Meetings**
 - Customer installation scheduling and coordination meetings
 - Coordinate any escalated customer installation issues to resolution

- **Monthly Vendor Statistical Meeting**
 - Vendor provided metrics or reports
 - WAN Utilization reports, Chronic Incident reports, CALNET contract SLA performance, etc...

- **Individual Case Basis (ICB) Pricing**
 - Review, monitor, and track vendor ICB circuit quotes or Statements of Work
 - Ensure scope accuracy and cost reasonableness before Form 20 order is placed

- **Vendor Maintenance Coordination**
 - Approve and post Vendor Maintenance Notices via OTech Service Desk Bulletins



CALNET

Matt Fairbairn
CALNET Engineering Section



CALNET Program (what is it?)

- CALNET is program
- CALNET Program Branch is located within STND
- We support and carry out policy per G.C. 11541



CALNET Program (what is it?)

- **Assess long range needs of the State**
 - Vendors/industry trends/tradeshows
- **Develop strategic policy**
 - State Telecommunications Management Manual (STMM)
- **Ensure that telecommunications needs of the State agencies are being met**
 - **CALNET Portfolio of Contracts**
 - Development of requirements
 - Contract administration



CALNET: Updates

■ What's happening?



CALNET: Updates

- **Category 3: Metropolitan Area Network (MAN)**
 - Metro Area Ethernet (MAE) service
 - Extended Demarcation Wiring Service
 - Services Related Hourly Support
- **Category 5: Managed Internet Service (MIS)**
 - Internet Flat Rate (InFRa) Service
 - Internet Flat Rate with Managed Router (InFRaM)
 - Internet Sustained Bandwidth Ethernet Transport
 - Internet Sustained Bandwidth Ethernet Port w/MR



CALNET 3: Additions

Category 10: Satellite

■ Category 10.1

- Satellite phones with associated service plans. Various satellite phones will be available along with monthly and usage based plans. In addition, the following services will be available:
 - BGAN equipment with associated plans
 - MSAT G2 equipment with associated plans

■ Category 10.2

- Satellite data service focused on public safety applications. Services include:
 - Bandwidth in the Ku band
 - Indoor and outdoor satellite equipment
 - Teleport, gateway and NOC services

- IFB = Invitation for Bid





CALNET 3: Additions

Category 14: Broadband Internet; IFB – E

- **Category 14.1: Satellite based high speed internet**
 - Access that is always on,
 - Faster than traditional dialup access, and
 - Little or no SLA's.

- **Category 14.2: Terrestrial based high speed internet,**
 - Access that is always on,
 - Faster than traditional dialup access,
 - Includes DSL and fiber, and
 - Little or no SLA's

- **Category 14.3: Possible Wireless**





CALNET: Informational

- **Subcategory 1.6 – Legacy Telecommunications**
 - **Centrex Updates**



CALNET: Informational

- **Migrating from AT&T's Centrex to Voice over IP (VoIP)**
 - **Customer Responsibilities**
 - Request a CALNET 3 Contract Delegation
 - Proper Planning of a VoIP Implementation
 - Understand the VoIP Implementation Process
 - Provide VoIP contractor scrubbed and clean phone records



CALNET: Informational

- **Customer Responsibilities**
 - **Submitting a CALNET 3 Contract Delegation**
 - **Statewide Telecommunications Management Manual (Section 3-502.0 – CALNET 3 Delegation)**



CALNET: Informational

- **Customer Responsibilities**
 - **Proper planning of a VoIP Implementation**



CALNET: Informational

- **Customer Responsibilities**
 - **Understanding the VoIP Implementation Process**
 - **Complexity**
 - **Schedules and timelines**



CALNET: Informational

- **Customer Responsibilities**
 - If you Port existing Centrex Phone Number to VoIP it is critical that you provide clean phone records to the new VoIP provider.



CALNET: Links

■ CALNET Website

<http://www.otech.ca.gov/stnd/calnet3/>

- Frequently Asked Questions
- Catalogs
- Bulletins
- User Instructions
- STMM

■ Vendor websites

- Listed on the CALNET site

■ Customer Service Line

- 916-657-9150



Questions and Answers

