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)

California Department of Technology
Office of Technology Services

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	Enterprise Network Branch
	Rick Bieniek	Network Architecture & Security Engineering Unit
	Eric Ehnisz	Customer Systems & Security Engineering Unit
9:25 – 9:40 AM	Updates on Infrastructure Improvements	
	Greg Soria	Engineering Division /Windows Projects Unit
	AbdulMalik AbdulRahman-Wells	Network Architecture & Security Engineering Unit
	Bryan Rusk	Network Architecture & Security Engineering Unit
9:40 - 10:00 AM	BREAK (20 minutes)	
10:00 - 10:20 AM	CGEN Updates	
	John Sweet	Network Service Management Section
	Scott Murray	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

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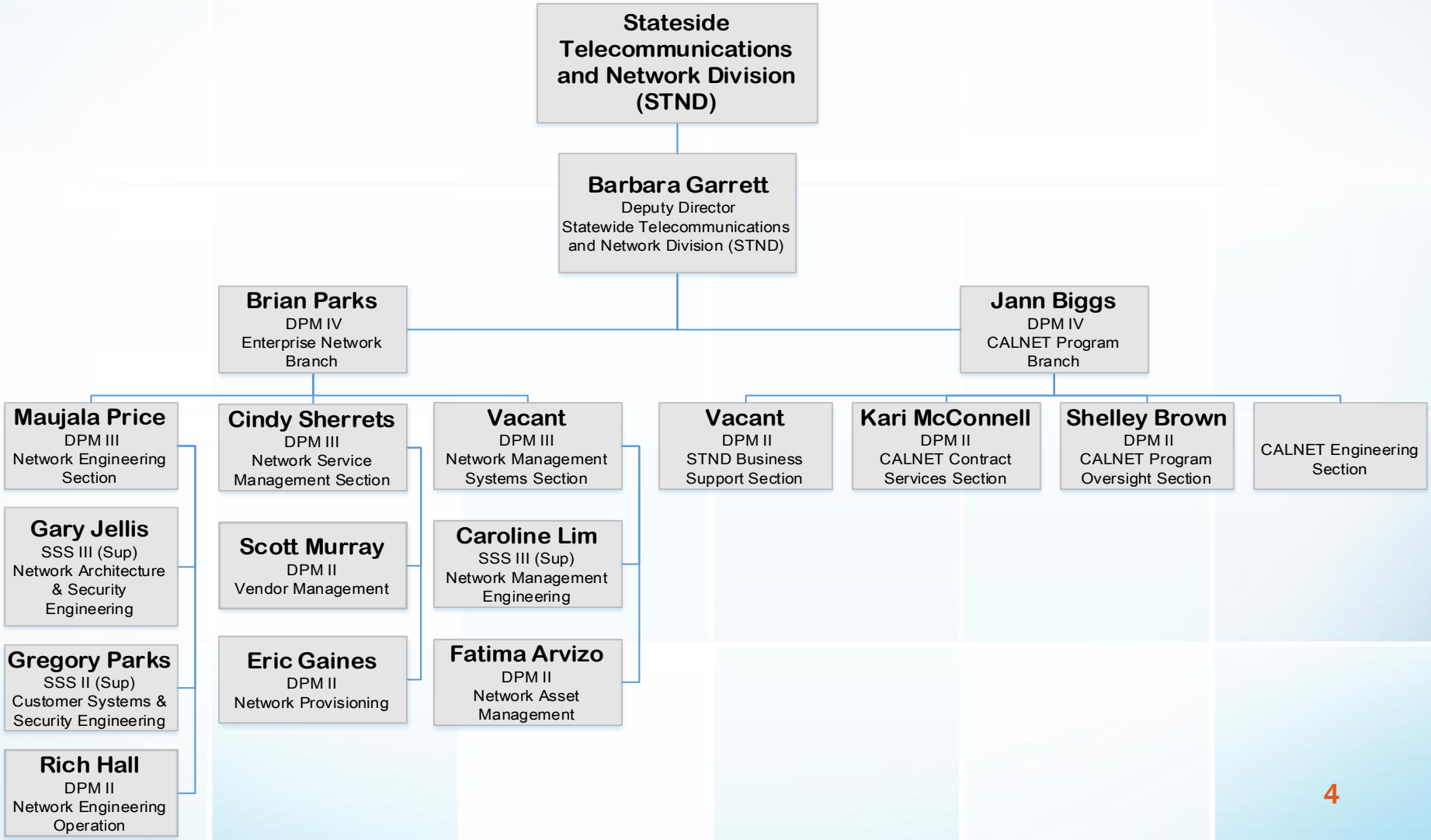
STND Org Chart



Information Sharing

Brian Parks

Branch Chief

Enterprise Network Branch

CENIC

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

CENIC & Department of Technology

- CENIC and CDT have agreed to connect CalREN 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

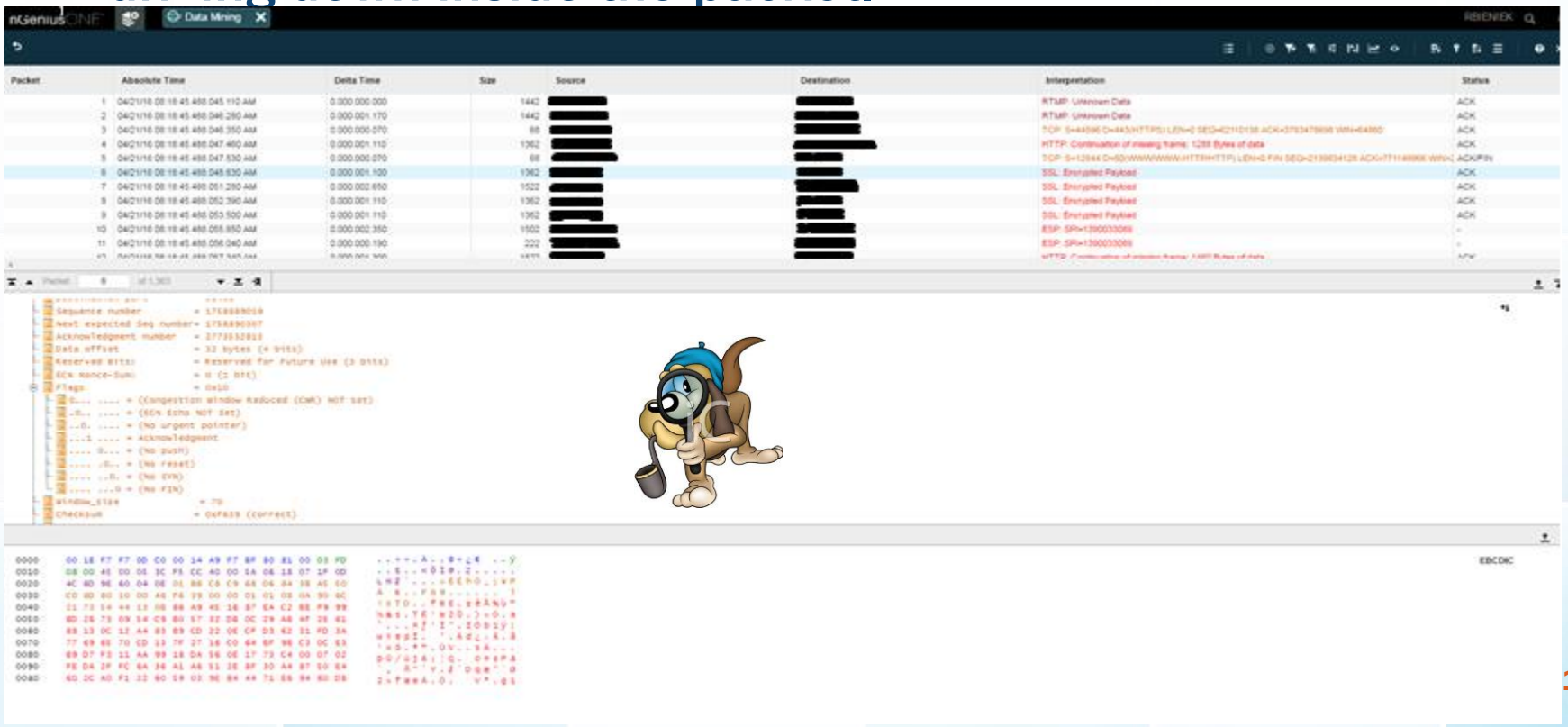
What is a Sniffer?

- 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

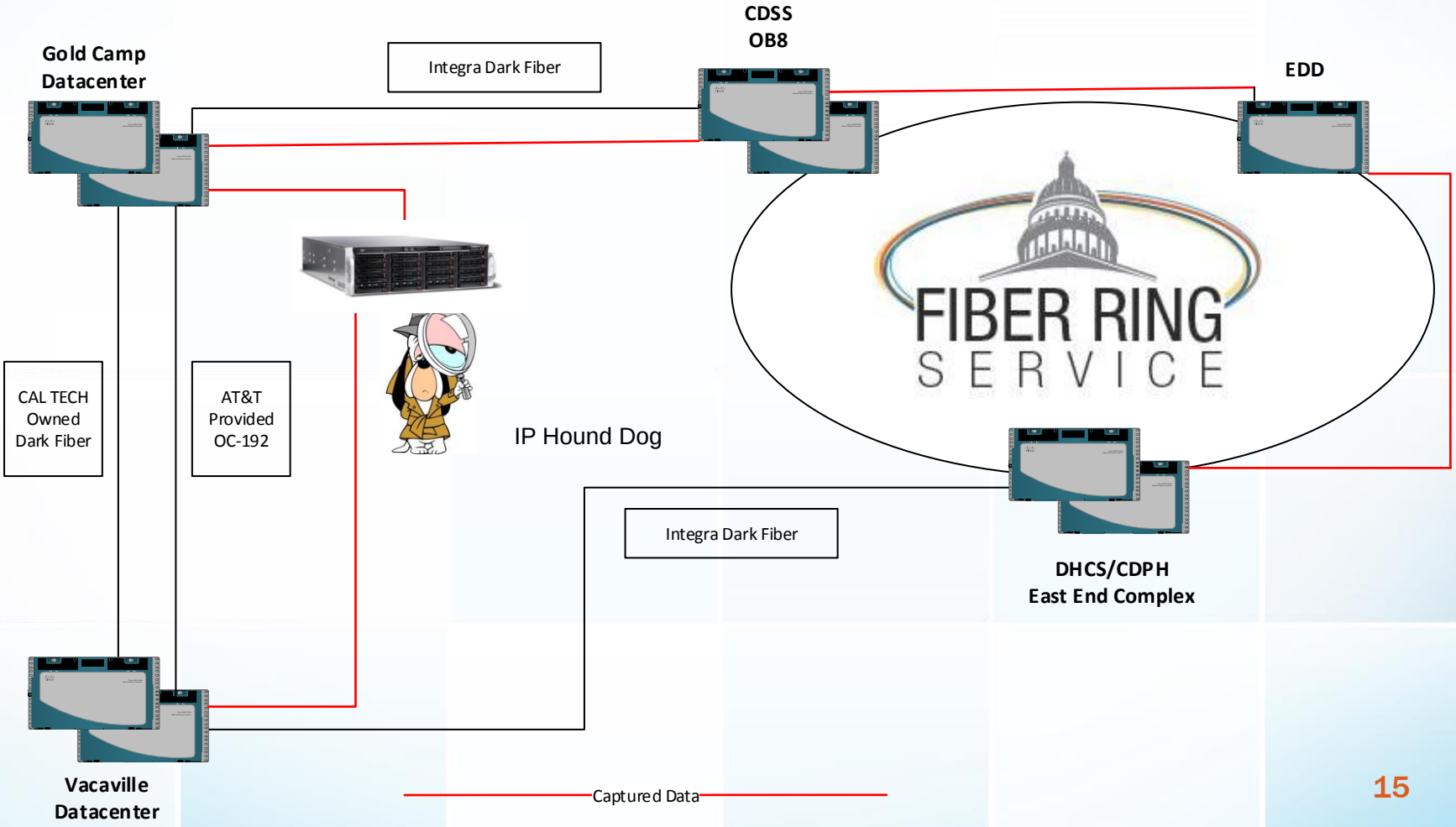
FRS Sniffers

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



FRS Sniffers

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



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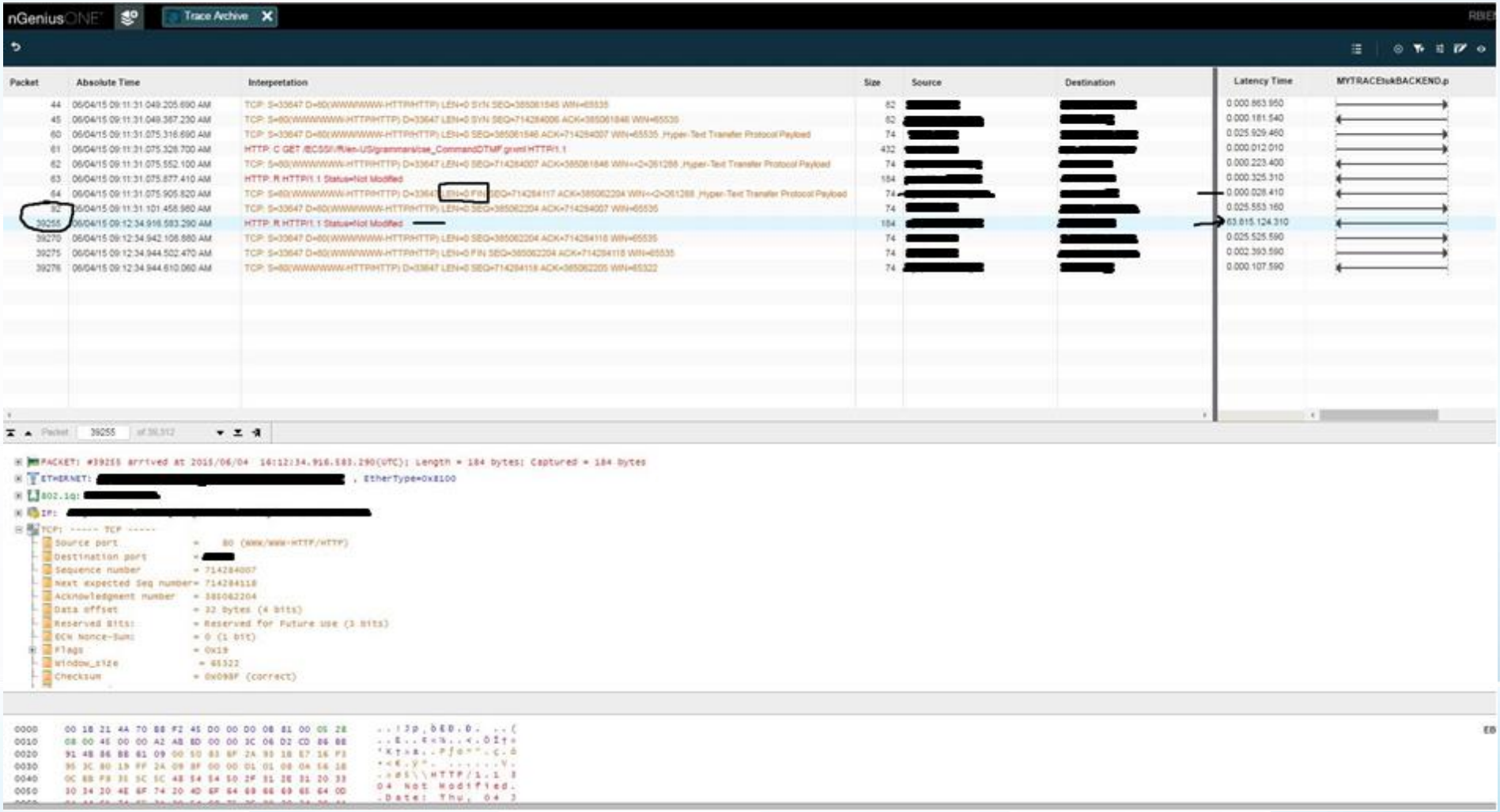
FRS Sniffers



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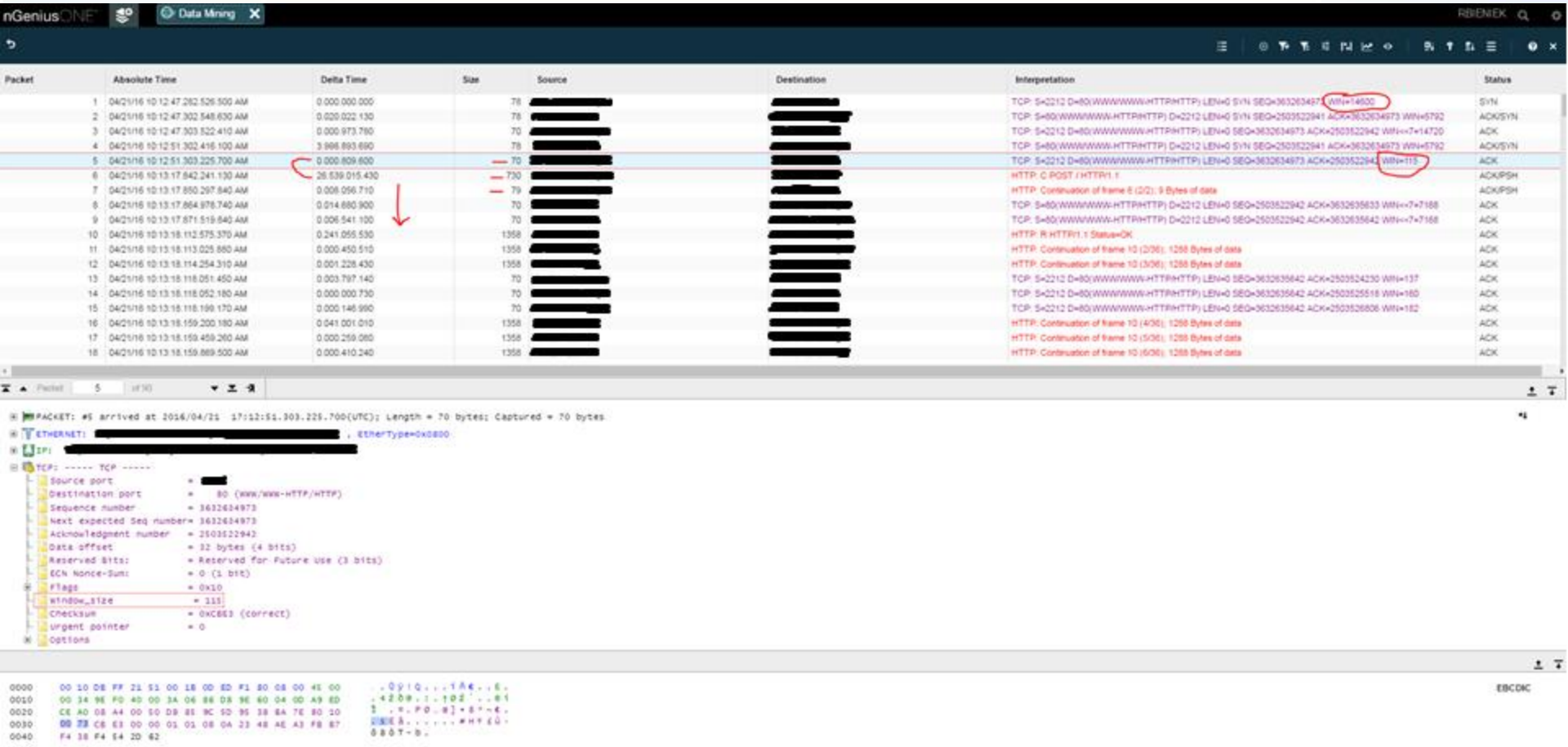
FRS Sniffers



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

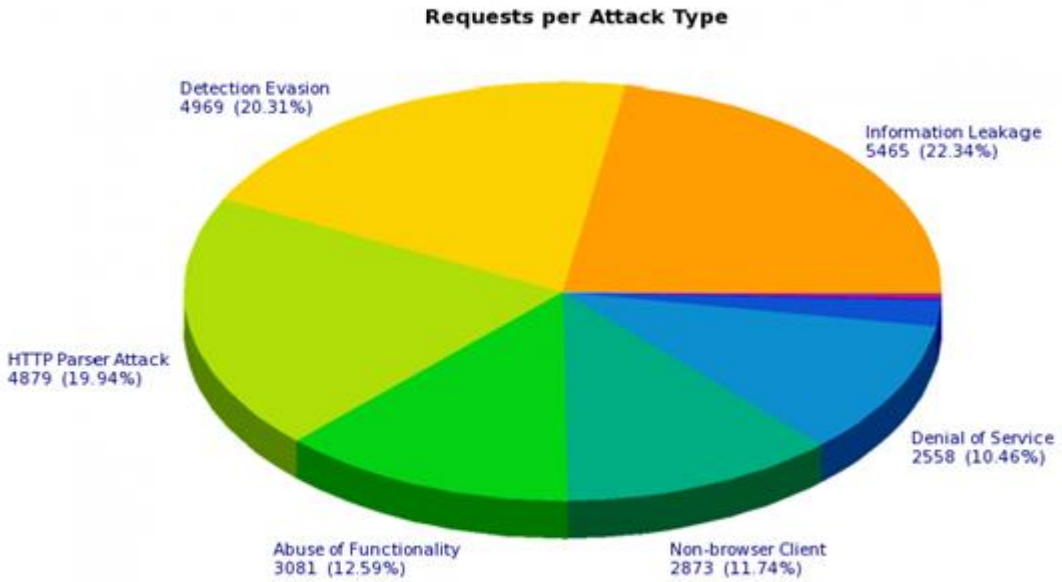
Engineering Division

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

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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.

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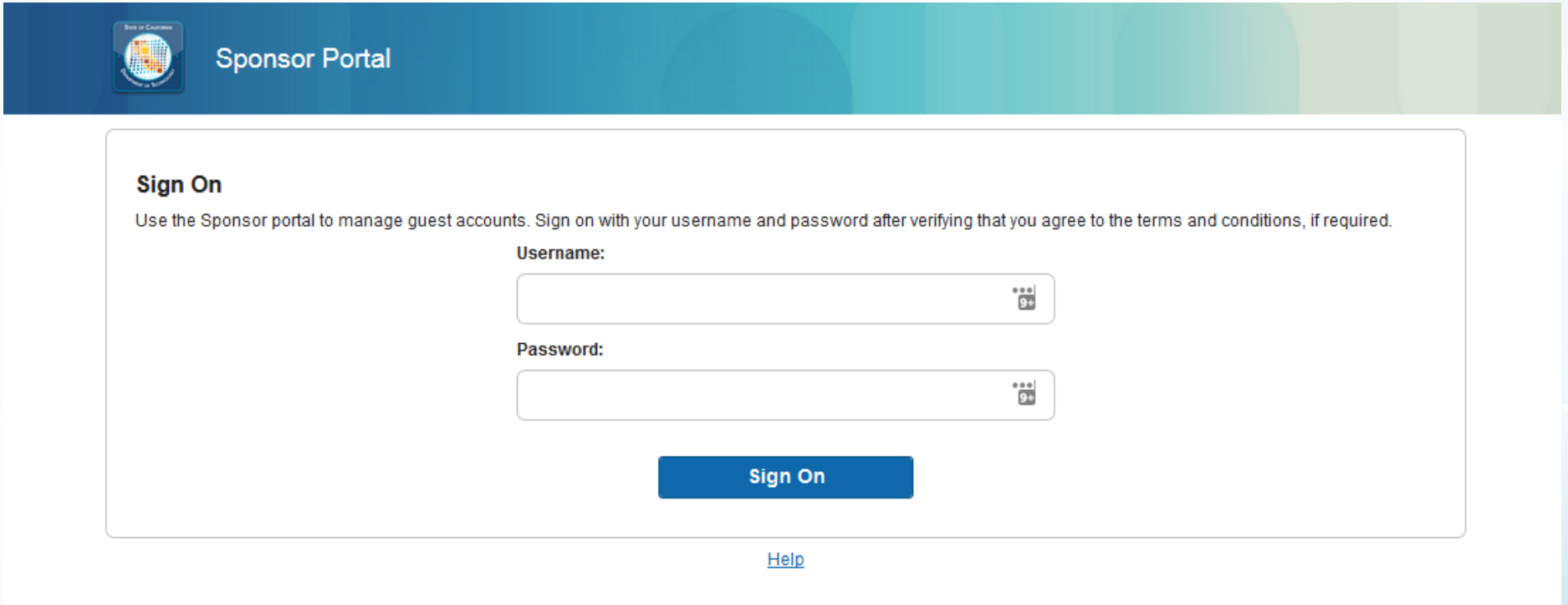
Sponsor Portal



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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

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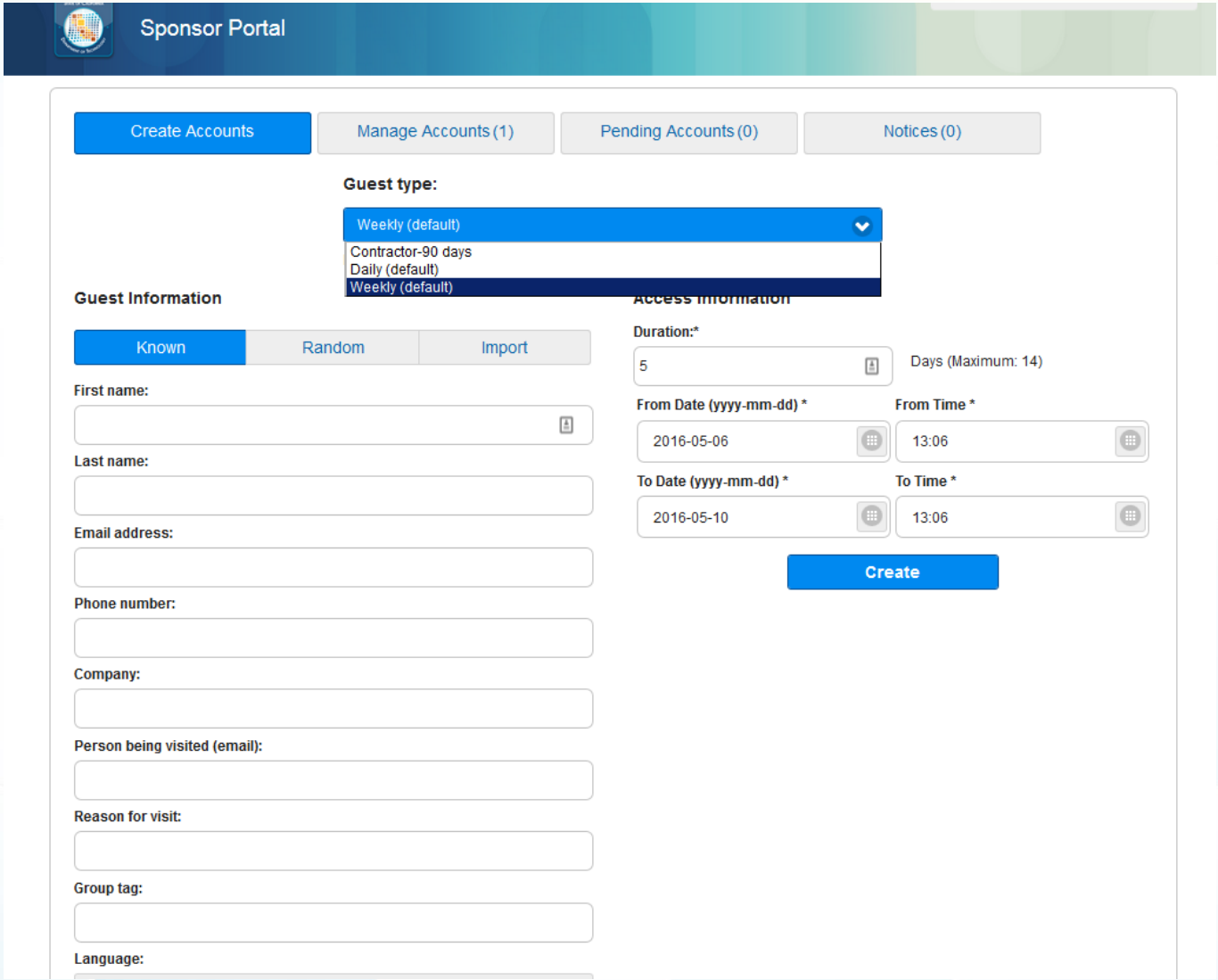
Sponsor Portal cont.



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

FIBER RING SERVICE

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

FIBER RING SERVICE

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