

Quarterly Network Forum

November 14th, 2012



Today's Agenda

9:30am – 9:40am Opening and Introduction

Neeraj Chauhan, Network Branch Chief, STND Division

9:40am – 9:55am Update on projects and major efforts

Brian Parks, Network Engineering Section Manager

9:55am – 10:15am Technical Project Review

Mitch Howard, Network Engineering Unit Manager

10:15am – 10:30am Overview of Outages

Caroline Lim, Network Monitoring Unit Manager

10:30am – 10:45am CGEN

Jann Biggs, CGEN Service Manager

10:45am – 10:55am SR process and SLO

Rich Hall, Network Projects Unit Manager

10:55am – Q and A



OTech Network Organization

Neeraj Chauhan
DPMIV, Network Branch Chief

Brian Parks
DPMIII, Network Engineering

Mehdi Ghomeshi
DPMIII, Network Infrastructure

Caroline Lim
SSSIII (Sup),
Monitoring

Gregory Parks
SSSIII (Sup),
Projects

Mitch Howard
SSSIII (Sup),
Operations

Sylvia Oropeza
DPMI, Assets

Cindy Sherrets
DPMII, Installs

Rich Hall
DPMII, Projects

Updates on Projects and Major Efforts





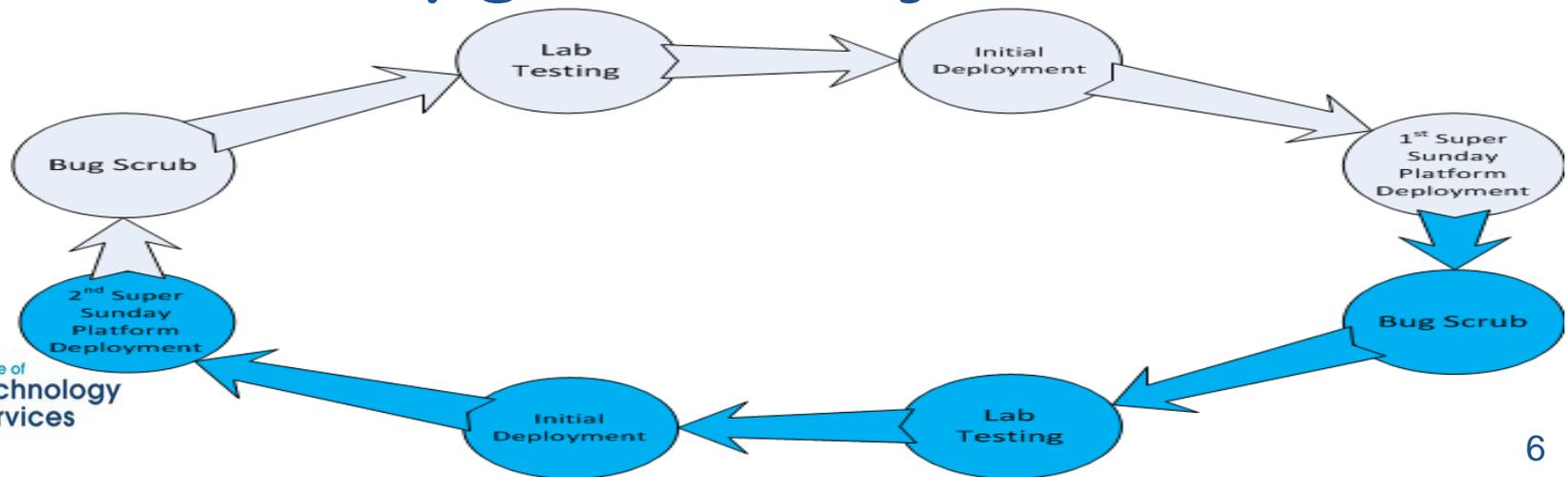
Projects and Major Efforts

- **Network Equipment Software Upgrades**
- **Network Equipment Hardware Refresh**
- **Network Redundancy**
- **IPv6**



Network Equipment Software Upgrades

- Benefits
- Initial Implementation Strategy
- Ongoing Implementation Strategy
- Communications and Notification
- Software upgrade lifecycle



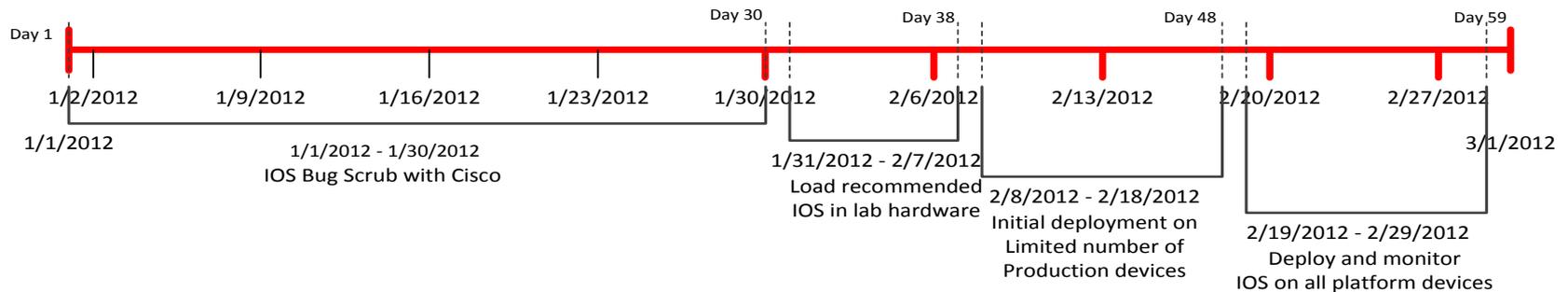


Network Equipment Software Upgrades

Network Equipment Software Upgrades Timeline (Initial Implementation)

Below is a timeline indicating the major activities involved in a platform IOS upgrade, and how much time is typically required for each major activity. This example shows the time spans for the IOS upgrade if the effort is initiated January 1st. For the initial implementation, several platforms require upgrades, so this process will be repeated for each platform until all platforms are on current code.

IOS Deployment for a single platform



There are four major activities involved in a platform IOS upgrade: 1) IOS Bug Scrub, 2) Lab testing of the recommended version of IOS, 3) Initial deployment on a small subset of the platform, and 4) deployment on the entire platform.

The **IOS Bug Scrub** activity is critical to a successful deployment of new code. The bug scrub process involves OTech technical staff working closely with Cisco to document features used for a given platform. Cisco then evaluates IOS software for bugs that could affect the features in use. The outcome of this process is a recommended version of IOS that has been evaluated against features used by OTech and found to be free of bugs that could impact the platform.

The **Lab Test** activity involves loading the new code on a platform device in the test lab to verify whether the format of the configuration is compatible with the old version of code without building scripts for new or changed default values .

The **Initial Deployment** activity results in the new version of code being deployed on a limited number of platform devices, which are then monitored for several days to verify there is no negative impact on the platform or on customer traffic.

If the **Initial Deployment** activity is successful, the **Platform Deployment activity** results in the new version of code being deployed on all platform devices. The platform devices are then monitored for several days to verify there is no negative impact on the platform or on customer traffic.

If at any point problems or issues are identified with the new IOS code, the process will stop. If necessary, the most recent activity will be reversed to mitigate any negative impact. OTech will engage Cisco to determine the cause of the problem/issue, and whether the process needs to start over again with the **IOS Bug Scrub** activity.

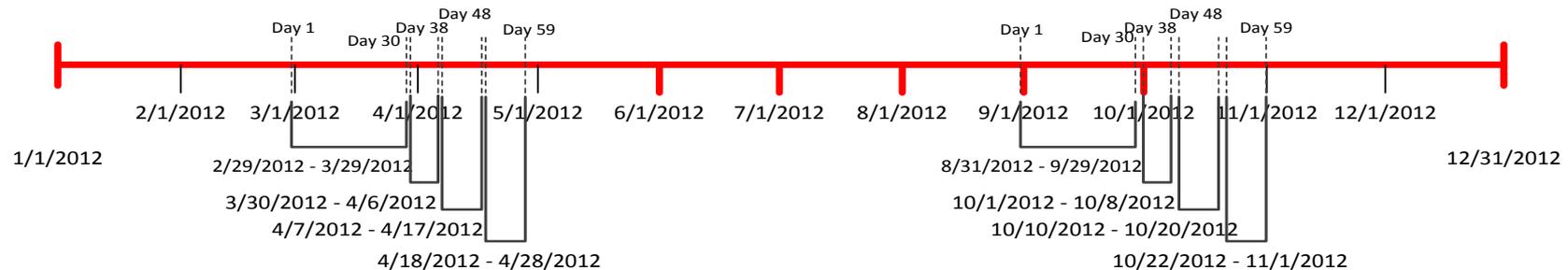


Network Equipment Software Upgrades

Network Equipment Software Upgrades Timeline (Ongoing Implementation)

Below is a timeline indicating the major activities involved in a platform IOS upgrade, and how much time is typically required for each major activity. This example shows two upgrade windows per year that will be used to keep IOS code current in the future.

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Network Equipment Software Upgrades

- **Communications and Notification**
 - These code upgrades will be widely advertised and communicated
 - Service Desk Bulletin
 - Customer Delivery Division



Network Equipment Hardware Refresh

- Quarterly hardware orders
- Initial focus – critical hardware that is at or approaching End Of Support or End Of Life (EOS/EOL)
- Refresh order completed this summer, implementation in progress
- We are currently working with Cisco on the next order



Network Redundancy

- **Recent outages emphasize need for more robust redundancy**
 - **OTech campus networks**
 - **Internet Service Provider (ISP) connections**
 - **CSGnet**
 - **CGEN (i-Hubs)**
 - **Customer networks**
 - **OTech staffing**



Technical Project Reviews

- **IPv6 evaluation and implementation**
- **Scope**
 - Implement IPv6 on limited number of devices and test
 - Test to internet Successful
- **Challenges/Issues**
 - New Technology
- **Lessons Learned**
 - We are ready for IPv6

Technical Project Reviews

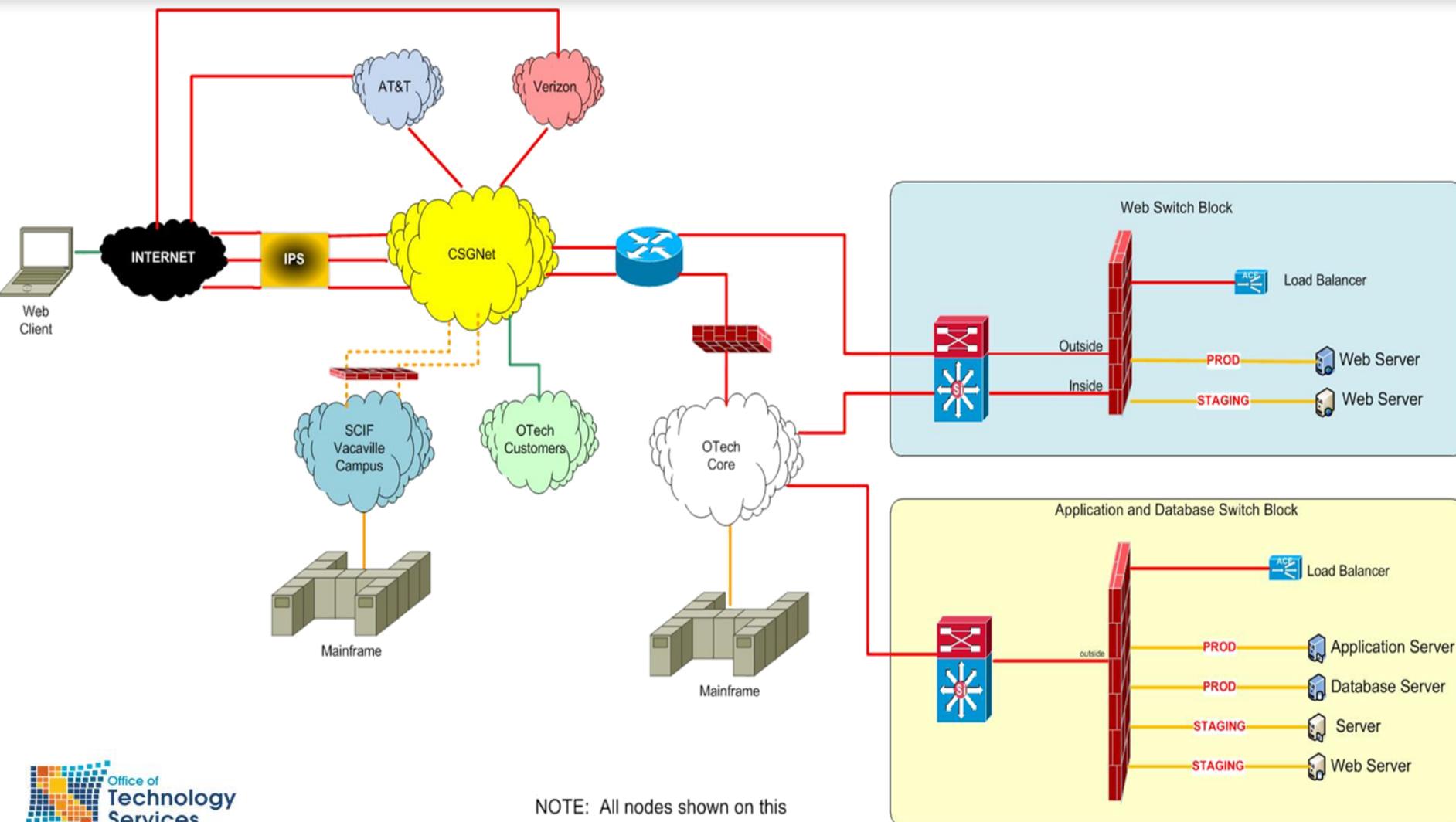




Technical Project Reviews

- **Firewall upgrades**
- **Juniper Switch Block install**
- **VLAN Migration Project**

Technical Project Reviews



NOTE: All nodes shown on this diagram are redundant.



Technical Project Reviews

- **Firewall upgrades**
- **Scope**
 - Migrate 7 EOL Firewalls
- **Considerations**
 - Procurement
 - Technology
 - Resources and Timeframes
- **Lessons Learned**
 - 3 Firewalls Migrated Successfully



Technical Project Reviews

- **Juniper Switch Block install**
- **Scope**
 - Exchange Switch Block
- **Considerations**
 - Interoperability
 - Training and Support
- **Lessons Learned**
 - Just in Time Procurement



Technical Project Reviews

- **VLAN Migration**
- **Scope**
 - Move to 10 Gigabit Network
 - Over 300 VLANs, 2000 Servers Migrated
- **Considerations**
 - Working with Service Areas and Customers
 - Minimizing Impact of Changes
- **Lessons Learned**
 - Creating Repeatable Processes

Review of Outages Past Quarter





Review of Outages for Past Quarter

- **Summary of OTech outages**
 - 7/30 DNS Outage
 - 7/30 Santa Ana Central Office Fiber
 - 8/11 Access to CAMail
 - 8/14 Network Connectivity for DMV & Telco Outage
 - 9/7 Access List Consolidation for DMV
 - 9/7 Oakland Central Office Hardware
 - 9/12 Natomas Central Office Hardware
 - 9/20 Switch Supervisor Module Failure



Review of Outages for Past Quarter

- **Root Cause**
 - **Human Errors**
 - **Hardware Failures**
 - **Software Problems**



Review of Outages for Past Quarter

- **Lessons Learned**
 - Continue Peer Review
 - Standardize Processes
 - Immediately open TAC Case with Vendor
 - Hardware Availability
 - Tool Visibility



Review of Outages for Past Quarter

- **Corrective Actions**
 - Operations Binder for Network Engineers
 - Training for Staff
 - Duty Person
 - Review Redundancy
 - Regularly scheduled Hardware/Software upgrades
 - Monthly Meetings with Vendor Partners
 - Review Outage
 - Lessons Learned
 - Holding our Venders Accountable

California Government Enterprise Network

CGEN



CGEN – Migration Progress

- Migration numbers for customers in each stage:
 - 45 customers fully migrated with 512 circuits on CGEN
 - 57 customers in various stages between the design process and LAN cutovers have started
 - 2 customers to be engaged



CGEN – Migration Process

Weeks





CGEN – Vendor Responsibilities

Activities

- Provisioning
- 24 x 7 Service Desk
- Project Management

Provide Portals and Reporting

- Customer can monitor own circuits/routers
- Individual customer training
- Monthly demonstrations

SLAs

- CALNET Website (see handout)
- A subset follows

Performance

- Current metrics following



CGEN – Vendor SLAs

	Category	Objectives – both vendors
1	<u>Availability</u> Aggregated over CGEN speeds and both vendor	99.6%
2	<u>Catastrophic Outage 1</u> Total loss of at one address	Less than 2 hours
3	<u>Catastrophic Outage 2</u> A total failure of in the Contractor’s equipment (central office, backbone, or a subcontractor’s).	Less than 30 minutes
4	<u>Catastrophic Outage 3</u> The total loss of more than one service type in central office, or the loss of any service type on a system wide basis.	Less than 15 minutes
5	<u>Packet Loss</u> Measured from Contractor’s hand off to a Customer at each end of data channel.	0.5 percent maximum packet loss
6	<u>Excessive Outage</u> An Excessive outage shall be defined as a trouble ticket that remains opened with the Contractor on a service, for more than twelve hours.	Less than 12 hours

Note: This is a brief, condensed version; consult the CalNet website for conclusive information.



CGEN – OTech Responsibilities

- **Vendor Management**
 - Provisioning
 - SLAs
 - Incidents
- **Service Desk**
 - First point of contact
 - Communication and escalation
- **Changes**
 - Service Requests for billable changes
 - Remedy for non-billable changes
- **Security**
 - OTech staff background checks and fingerprinted
 - NIST 800-53 Standards, Moderate level
 - IPS, IDS, DOS
- **Governance Board**
- **Infrastructure Consolidation Program**

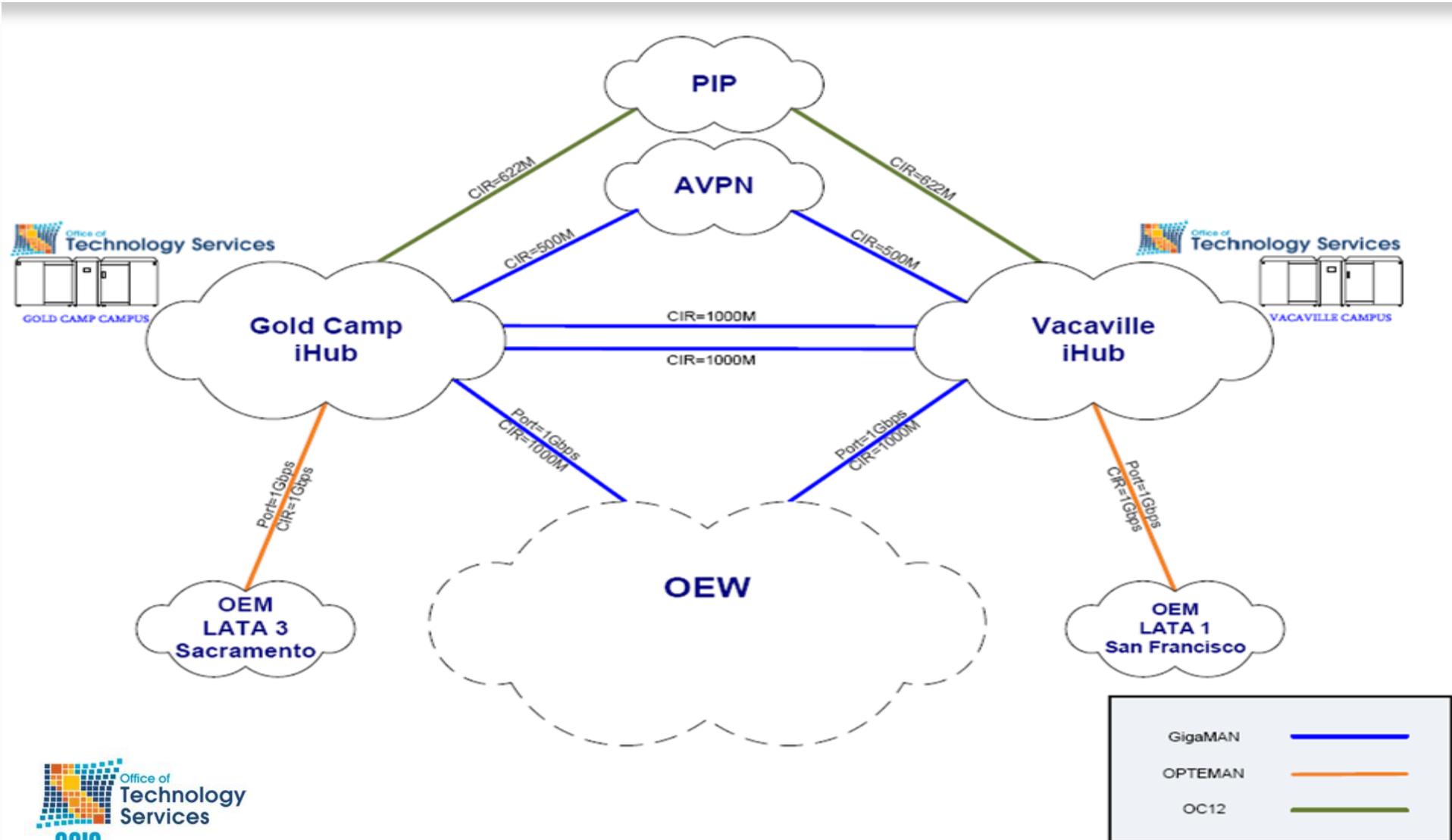


CGEN – Customer Responsibilities

- **In production**
 - Keep local contact information current with OTech
 - Use OTech Service Desk as first point of contact
 - Use the vendor's portal to view service health, to create service reports, and to monitor incidents
 - Keep portal access for users current with OTech



CGEN – Infrastructure



Service Level Objectives and Service Requests





Service Level Objectives

Network Engineering Branch Service Level Objectives		
Service - What	SR - How / Mechanism	Estimated Completion Time Business days
Enterprise Engineering Unit		
Firewall Changes	CSS Service Request	5 Days (Expedited 1 Day)
Work Orders: e.g., 1.IP Addressing 2.Router Configuration 3.VPN Services 4.Switch Configuration 5.General Information 6.Router Access 7.Load balancing 8.Routing Issues	WO Request	3 Days (Expedited 1 Day with fee for expedite)
Network Consulting e.g., Customer Firewall Installation – Generally 6 hours of Consulting Time Required	CSS Service Request	Project Dependent
Project Engineering Unit		
Requirements Document	WO Request or, CSS Service Request	20 days
Design Documents (e.g., Network Diagram)	WO Request or, CSS Service Request	20 - 40 days
Execution Phase: e.g., 1.IP Addressing 2.Router Configuration 3.VPN Services 4.Switch Configuration 5.VLAN Configuration 6.Router Access 7.Load balancing	WO Request or, CSS Service Request	2 - 5 days
Project Engineering testing w/ customers/ developers	WO Request or, CSS Service Request	1 - 30 days
Network Management Unit		
Domain Name Service (DNS) request	Remedy SRM	2 Days
DNS expedite - Time to Live (TTL)	Remedy SRM	1 Day
HP Operation Manager integration (Omi) Tuning	Remedy CRQ	10 days
HP Network Nod Mgr integration (NNMi) Tuning	Remedy CRQ	10 days
Network Projects Unit		
Circuit Installation on CSGNET Timeline below include: SR approval process; procurements of the equipment and Software (if required); Order Circuit (Telco Std. timeline); and Scheduled installation		
CIR Change (Increase / Decrease)	CSS Service Request	30 calendar days or, less
Circuit Disconnect	CSS Service Request	30 calendar days or, less
56kb or, T-1	CSS Service Request	46 - 60 calendar days (Expedite 45 calendar days or, less with expedite fee)
DS3, OCX, Opt-e- man and Gigaman - Regular Requests only	CSS Service Request	90 - 180 calendar days (Expedite process not available)

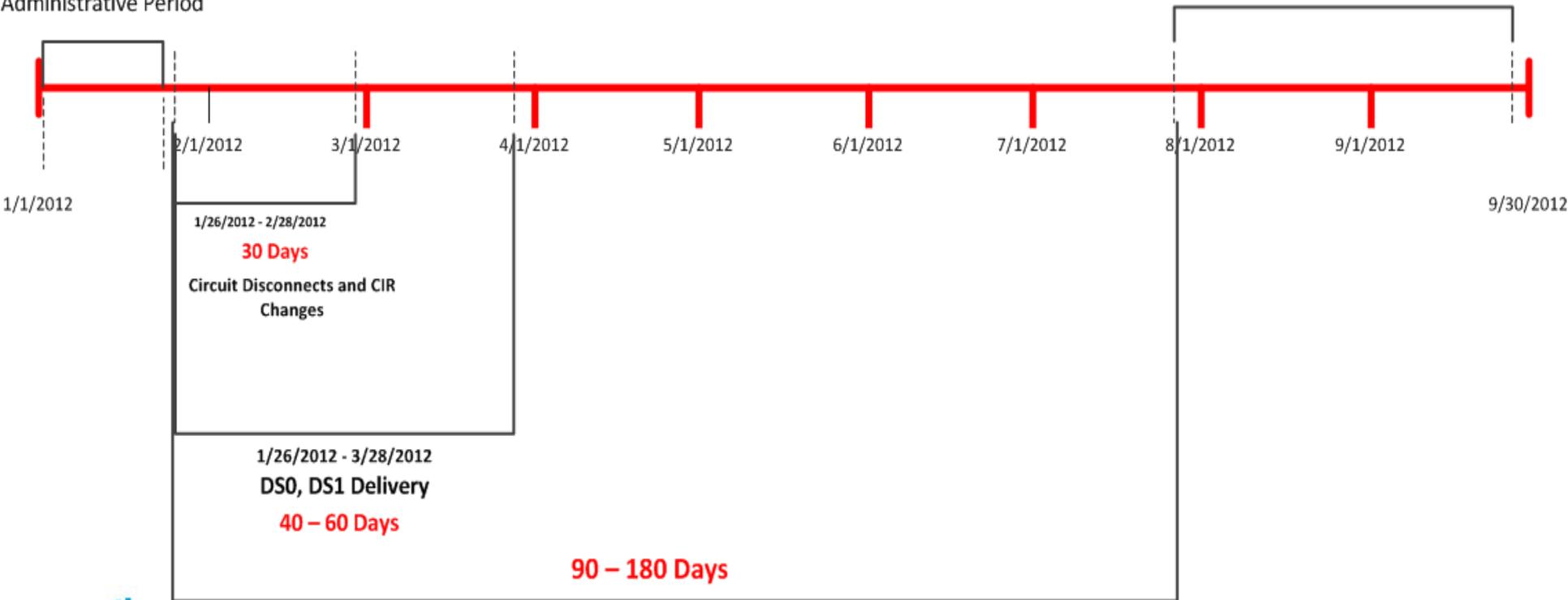
The Service Request Process

Service Request Life Cycle for Telco Circuit Provisioning

Below is a chart showing service delivery times of specific services as described by the Network Projects SLOs. This example shows the time spans for the services if requested via CSS on January 2nd.

1/2/2012 - 1/24/2012
Administrative Period

7/27/2012 - 9/27/2012
Closure Period



Questions and Answers

