

**Schedule 13**  
**Funding Request for the 2014-15 Budget Cycle**

Department: Governor's Office of Information Technology

Request Title: Capitol Complex Network Resiliency

Priority Number: R-4

Dept. Approval by: *Daniel B. King* 11/1/2013  
 Date

- Decision Item FY 2014-15
- Base Reduction Item FY 2014-15
- Supplemental FY 2013-14
- Budget Amendment FY 2014-15

OSPB Approval by: *Grant M. ...* 10/29/13  
 Date

Line Item Information		FY 2013-14		FY 2014-15		FY 2015-16
		1	2	3	4	5
		Appropriation FY 2013-14	Supplemental Request FY 2013-14	Base Request FY 2014-15	Funding Change Request FY 2014-15	Continuation Amount FY 2015-16
	Fund					
<b>Total of All Line Items</b>	<b>Total</b>	17,618,488	-	16,224,120	660,000	95,000
	FTE	-	-	-	-	-
	GF	57,499	-	-	-	-
	GFE	-	-	-	-	-
	CF	1,200,000	-	1,200,000	-	-
	RF	16,360,989	-	15,024,120	660,000	95,000
	FF	-	-	-	-	-
<b>(5) Office of Information Technology, (C) Network Services, (1) Network Services, Operating Expenses</b>	<b>Total</b>	17,618,488	-	16,224,120	660,000	95,000
	FTE	-	-	-	-	-
	GF	57,499	-	-	-	-
	GFE	-	-	-	-	-
	CF	1,200,000	-	1,200,000	-	-
	RF	16,360,989	-	15,024,120	660,000	95,000
	FF	-	-	-	-	-

Letternote Text Revision Required? Yes:  No:  If yes, describe the Letternote Text Revision:

Cash or Federal Fund Name and COFRS Fund Number: COFRS Fund 613

Reappropriated Funds Source, by Department and Line Item Name: User Charges

Approval by OIT? Yes:  No:  Not Required:

Schedule 13s from Affected Departments: The request requires corresponding schedule 13s from departments

Other Information:

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### ***Cost and FTE***

- This request is for an increase in a state wide augmentation and upgrade of the Capitol Complex equipment connecting to the Colorado State Network (CSN) supporting the Governor's Office of Information Technology (OIT) Cloud Strategy and Enterprise Architecture (EA) initiative. The request is for \$660,000 in FY2014-15 and \$95,000 in ongoing annual operating expenses. Funds requested are to be re-appropriated, and are to be used for critically needed upgrades and maintenance of the CSN.

### ***Current Program***

- In June 2011 the Governor's OIT entered into a new partnership with CenturyLink to upgrade the state's aging wide area network, previously referred to as the Multi-Use Network (MNT). The new contract brings with it significant cost savings, 21st century technology, and notable improvements to the statewide network.
- The CSN offers bundled services inclusive of network services (MPLS, MOE, Wave, Ethernet, etc.) as well as WAN CPE (Customer Premise Equipment), maintenance, and CSN network monitoring and management.

### ***Problem or Opportunity***

- There are areas in both the wide area network (WAN) and the new Virtualized Multiservice Data Centers (VMDC) of the CSN, within the Capitol Complex, requiring attention to mitigate implementation flaws, primarily single points of failure of key network equipment, the upgrade of key existing equipment to support new features and services required by the WAN and VMDC's, and the appropriate service and maintenance support for key hardware and software components.

### ***Consequences of Problem***

- OIT estimates the failure of a single non-redundant key network component without appropriate maintenance can cost the State over \$184,000 in revenue and repair due to a single 12 hour failure.
- Not upgrading key existing equipment will delay the migration of some agencies to the vBlock™ Infrastructure Platform and possibly stop the migration of others. This will result in anticipated total cost of ownership (TCO) reductions to not be delayed or even eliminated.
- The ongoing process of retrofitting older equipment for modern requirements of the CSN results in extreme inefficiencies of OIT personnel.
- Network service availability and performance problems will increasingly produce negative and more severe impacts to the citizens of Colorado.

### ***Proposed Solution***

- Proceed with detailed project planning for the phased replacement of critical equipment, within the Capitol Complex area, and to evaluate and begin urgent phased augmentation of major single points of failure of the CSN.
- Complete enterprise network management system (NMS) contract and begin immediate deployment of new toolsets.

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# COLORADO

## Office of Information Technology

FY 2014-15 Funding Request | November 1, 2013

John W. Hickenlooper  
Governor

Kristin D. Russell  
Secretary of Technology and  
Chief Information Officer

**Department Priority: R-4**  
**Request Detail: Capitol Complex Network Resiliency**

Summary of Incremental Funding Change for FY 2014-15	Total Funds	Re-Appropriated Funds
OIT Network Services Operating Expenses	\$660,000	\$660,000

### **Problem or Opportunity:**

Since the year 2000, the State's Network infrastructure has gradually evolved from a department-managed mainframe environment to a distributed enterprise infrastructure. State agencies anticipate and require the latest technologies at reduced cost. To satisfy new demands for computing efficiency through an aggressive virtualization migration initiative, and to establish an improved, cost-effective network services platform, OIT has been migrating the Network to a state-of-the art Multiprotocol Label Switching (MPLS) based wide area network (WAN). The MPLS based WAN is the foundation for a new Cloud architecture and a hybrid Cloud deployment model utilizing both private and public Cloud services available to all State agencies.

An example of a public Cloud service being deployed includes CenturyLink Managed VoIP services which greatly reduces the total cost of ownership of voice services for all State agencies.

The flagship private Cloud service being deployed is the implementation of the Virtual Computing Environment (VCE) vBlock™ Infrastructure Platform that delivers pervasive virtualization in a single, integrated platform; a platform that combines compute, network, storage, virtualization and management capabilities. To increase redundancy and availability, performance, security, and manageability, vBlock's are being deployed in Virtualized Multiservice Data Centers (VMDC). The VMDC is a reference architecture supporting critical IT initiatives, such as consolidation/virtualization, application migration and roll-outs, public, private and hybrid Cloud deployments.

However, there are areas in both the WAN and the new VMDC's, within the Capitol Complex area, that require attention.

- 1) Mitigate of legacy design and legacy implementation flaws, primarily single points of failure of key network equipment. OIT will provide validation of vendor changes to the network and conduct vendor management of the changes and updates.
- 2) Upgrade of key existing equipment to support new features and services required by the WAN and VMDC's.
- 3) Refresh appropriate service and maintenance support for key hardware and software components.

All three of these areas go hand in hand. It is estimated that the failure of a non-redundant key network component without appropriate maintenance can cost the State over \$184,000 due to a single 12 hour failure. Not upgrading key existing equipment will delay the migration of some State agencies to the vBlock™ Infrastructure Platform and possibly stop the migration of others.

### ***Proposed Solution:***

The Office of Information Technology requests \$660,000 in Reappropriated fund spending authority in FY 2014-15 to address two distinct areas: the WAN and the VMDC data centers, within the Capitol Complex area. The requested funds will be used to directly address and mitigate design and implementation flaws and to refresh service and maintenance support of key equipment.

The proposed solution is also closely tied to the success of the FY 2013-14 Playbook priorities, most importantly Customer Success, Innovation, and Service Excellence:

- Work to reduce costs for our customers and drive efficiencies for the state
- IT services are available anytime, anywhere, on any device
- Deliver services with high quality at a competitive price

It's also important to understand OIT resources are limited and is very difficult to reduce the mean time to repair (MTTR) of service outages in the current environment with many single points of failure and less than optimal equipment. The proposed solution lessens the dependence of single component failures as redundant and updated equipment will be in place.

One-time cost of this request is estimated at \$660,000 with annual maintenance of \$95,000 and is detailed in the included vendor quote. Current Network Operations staff will be responsible for implementation, deployment and management of the equipment requested in supporting document B.

### ***Anticipated Outcomes:***

The WAN and VMDC system consists of multiple technologies and components such as compute, storage, network, and network services components. These systems are integrated to leverage these multiple technologies to create a platform for OIT to continue offer and enhance Cloud services to all State agencies. As detailed in the OIT FY 2012-13 Report, consolidation and the implementation of newer technologies and the migration to Cloud based services enabled OIT to attain cost savings and avoidance of more than \$4.1 million in FY 2012-13. With the approval of these funds OIT expects to continue to achieve significant cost savings and avoidance in FY 2014-15.

Due to the interdependence of the components in these systems, fault and performance issues in these components impact the services offered. The large number of components and technologies necessary to deliver Cloud services increases the challenge of identifying the root cause and normalizing and correlating the faults that are generated by each of the individual components. To maintain 99.99% (and greater) network service availability it is critical that redundancy and resiliency in all areas of the network are addressed. With the approval of this decision item OIT expects to avoid catastrophic network service outages by increasing the redundancy and resiliency of the network, in addition to increased scalability allowing State Agencies to accelerate their virtualization migration plans.

**Assumptions and Calculations:**

**Agency Allocations**

The costs associated with this consolidation are anticipated to be included in a new component of the rate structure. As such, the existing rate structure is allocated to departments based on their number of FTE. The table below outlines the allocated costs to each department based on their annual FTE counted per month (e.g. 150.0 FTE x 12 months per year = 1,800.0).

<b>Department</b>	<b>FY15 Allocation</b>	<b>FY16 Est Allocation</b>
<b>Agriculture</b>	\$6,546	\$942
<b>Corrections</b>	\$138,991	\$20,006
<b>Education</b>	\$12,861	\$1,851
<b>Governor's Office</b>	\$24,168	\$3,479
<b>Healthcare Policy and Finance</b>	\$7,885	\$1,135
<b>Higher Education</b>	\$2,945	\$424
<b>Human Services</b>	\$110,672	\$15,930
<b>Judicial</b>	\$96,132	\$13,837
<b>Labor and Employment</b>	\$25,346	\$3,648
<b>Law</b>	\$9,532	\$1,372
<b>Local Affairs</b>	\$3,267	\$470
<b>Military and Veterans Affairs</b>	\$3,266	\$470
<b>Natural Resources</b>	\$32,654	\$4,700
<b>Personnel and Administration</b>	\$8,275	\$1,191
<b>Public Health and Environment</b>	\$29,165	\$4,198
<b>Public Safety</b>	\$35,510	\$5,111
<b>Regulatory Agencies</b>	\$12,657	\$1,822
<b>Revenue</b>	\$27,432	\$3,949
<b>State</b>	\$2,590	\$373
<b>Transportation</b>	\$69,449	\$9,996
<b>Treasurer</b>	\$655	\$94
<b>Total</b>	<b>\$660,000</b>	<b>\$95,000</b>

**Supporting document A:**

Network diagram depicting locations where equipment is recommended to be replaced due to critical single point of failure or equipment is end of life and out of maintenance support.



**Supporting document B:**

Below is detailed information cross referencing the network diagram by location as well as identifying equipment recommended to be replaced and the proposal of new equipment and approximate costs (which is subject to change due to technology advances, architectural design changes and/or customer requirements). Supporting document B is a quote from a vendor.

**Lakewood Data Center** -

Replace 11+ year old Cisco 6509 Sup 1A's and HP 5406/5412's with:

8 - Cisco Nexus 2k's for an estimated cost of \$55,981.12

2 - Cisco Nexus 5k 2 for an estimated cost of \$34,952.14

**Pueblo – 2 Jetway** –

Replace 11+ year old Cisco 6509 Sup 1A with:

3 - Cisco 2960x Switches for an estimated cost of \$18,000.

**4201 E. Arkansas** -

Replace 11+ year old Cisco 6509 Sup 1A with:

2 - Cisco 2960x Switches for an estimated cost of \$12,000.

**North Campus – DPA** –

Replace 11+ year old Cisco 6509 Sup 1A with:

5 - Cisco 2960xr Switches for an estimated cost of \$50,000.

**Grand Jet 222 S. 6** –

Replace 11+ year old Cisco 6509 Sup 1A with:

1 - Cisco 2960xr Switch for an estimated cost of \$6,000.

1 - Cisco 3750 Switch for an estimated cost of \$14,934.

**Cap Life Bldg. - 225 E. 16<sup>th</sup>** –

Replace a donated aging Cisco 3750x 24 port fiber and copper SFP 1 gig distribution switch with:

1 - Cisco 3750 Switch for an estimated cost of \$15,000.

**1525 Sherman SB** –

Replace 11+ year old Cisco 6509 Sup 1A with:

2 - Cisco 2960x Switch for an estimated cost of \$12,000.

**Microwave shops around the state** –

Replace 15 x 15+ year old Cisco 2911's with T1 and Ethernet connections with:

15 - Cisco 1921 routers for an estimated cost of \$22,500.

**Switch downtime used by DPA, Gov, Treasury -**

Replace 10+ year old 10 x 48 port 1 gig Cisco 3750's switches with:

10 - Cisco 2960xr Switches for an estimated cost of \$60,000.

**Supporting document C:**

Example of Cost to state for equipment failure.

