



Request for Clarification

Solicitation #: 99999-SPD0000071

Solicitation Title: Networking Equipment and IT Infrastructure Products

Supplier Name: Cisco Systems

Request No.: 01	Supplier's Authorized Contact : Mark Slafka Email: mslafka@cisco.com
Date of Request: 02/20/2012	Offeror's Response Due By (Date): 02/28/2012 Email Response to Issuing Officer (Name): Janet Pytelewski at email address: janet.pytelewski@doas.ga.gov
<u>Submission Instructions:</u> 1. A written response, as specified below, must be submitted in response to this request for clarification. 2. Clarifications must be submitted by e-mail and followed by a signed hard-copy confirmation via fax, email, mail or delivery, to: Issuing Officer: Janet Pytelewski Entity Name: DOAS Entity Fax No.: 770-408-5604	

The State Entity requests the supplier provide clarification regarding the following (reference applicable solicitation section/question #, etc.):

RFP Question #C1.1 for Wired Networking & Infrastructure Products

The State of Georgia expects to award multiple contracts for the right to supply networking equipment and related IT infrastructure products and services, Manufacturer must describe its core equipment offering (in terms of product series/lines/families for Product Category 1). For the product series/lines/families offered in Product Category 1, Manufacturer should summarize current product/service capabilities, quality, benefits and feature set.

Cisco's RFP response did not provide the State of Georgia with sufficient details regarding its product portfolio. Please review your response and, at a minimum, provide additional information on your "featured products" under the router and switch areas. The State wants to understand which product areas/products are being offered, information on capacities, features (modular/expandable, connectivity, integration, etc. and targeted environments (i.e., campus, small agency, etc.)

Supplier's Clarification Response: Cisco is an industry leader in Wired Networking and Infrastructure Products. For more than 25 years, Cisco has been developing world-class networking products to help connect governments, businesses, schools, and communities. At the heart of any network is the routing and switching infrastructure. Cisco offers a variety of infrastructure products to fit the Core, Distribution Layer and Access Layer of the network. Whether you are a large, multi-location state-wide government agency, a single-site local government, or a K-12 school district or college campus, Cisco's networking infrastructure products can be scaled to adapt and meet the needs of the user. Cisco's routing and switching portfolio provides users with highly configurable and scalable options to meet the ever changing demands that are placed on the network.

The information below addresses the following:

- Section 1 – Describes and summarizes the switching and routing portfolio. The product families are briefly defined and several technical features are presented.
- Section 2 – Outlines the product families and presents the solution overview and benefits that can be gained from the technology.
- Section 3 – Discusses Cisco's commitment to research and development and to bringing more leading product offerings to the marketplace.

1. Cisco Switching/Routing Description and Features

I. Campus LAN – Core/Distribution Switches

Scale network performance and reliability with industry- leading network services, integrated service modules, and validated design guides.

Cisco Catalyst 6500 Series Switches

- Flagship Catalyst switching services platform for core-distribution deployments
- Virtual Switching System bolsters availability and scales to 4-terabit capacity
- Up to 160 gigabits per slot; 100 Gigabit Ethernet ready
- Simplifies creation of separate logical networks with Easy Virtual Network (EVN)
- Integrated services modules enhance security, manageability, and wireless control

Cisco Nexus 7000 Series Switches

- Highest switching capacity; up to 550 Gigabits per slot, 15 terabits per chassis
- Highest density 10 Gigabit Ethernet port aggregation; up to 512 ports per chassis
- Advanced high availability; hitless In-Service Software Upgrade (ISSU)
- Optimized for secure virtualized environments; TrustSec, Virtual Device Contexts
- Ideal for collapsed data center-campus core deployments

Cisco Catalyst 4500E Series Switches

- Modular switch offering 1.6-terabit capacity with Virtual Switching System
- Competitive feature set and performance for midsize distribution networks
- Flexible, comprehensive design adapts to changing system and service demands
- High availability bolstered by In-Service Software Upgrade and Control Plane Policing
- Ideal for collapsed distribution-access and small to medium distribution deployments

Cisco Catalyst 4500-X Series Switches

- Fixed aggregation switch for space-constrained environments, in a 1 RU form factor
- 1.6 terabits per second capacity with Virtual Switching System (hardware-ready)
- Best-in-class scalability of up to 32-times better routes than competitor products

- Simplifies creation of separate logical networks with Easy Virtual Network (EVN)
- Integrated services: medianet, Cisco Trustsec, Flexible NetFlow, and Wireshark

Cisco Catalyst 3750-X Series Switches

- Stackable fixed-configuration switches for smaller, restrictive deployments
- Advanced Layer 3 and Layer 2 switching and security services
- Support for Gigabit and 10 Gigabit Ethernet aggregation
- StackWise Plus and StackPower deliver high availability and operational efficiency
- Comprehensive support for high-value Borderless Networks services

II. Campus LAN – Access Switches

Adapt your network to meet evolving requirements and optimize new application deployments with Cisco access switches.

Cisco Catalyst 4500E Series Switches

- Leading Catalyst switching platform for Unified Access deployments
- High capacity (848 gigabits) and density (240 full Power Over Ethernet Plus ports)
- 60 Watt Universal Power Over Ethernet powers an unprecedented range of devices
- High availability with In-Service Software Upgrade and Stateful Switchover

Cisco Catalyst 3750-X Series Switches

- Stackable fixed-configuration switches for campus and branch deployments
- StackWise Plus and StackPower deliver high availability and operational efficiency
- Service and network modules help enable incremental link and service upgrades
- Full Power Over Ethernet Plus and comprehensive Borderless Networks services

Cisco Catalyst 3560-X Series Switches

- Fixed-configuration switches for campus and branch deployments
- High-availability and advanced security features assure consistent service
- Service and network modules help enable incremental link and service upgrades
- Full Power Over Ethernet Plus and comprehensive Borderless Networks services

Cisco Catalyst 2960 Series Switches

- Stackable (with Cisco FlexStack) fixed-configuration Layer 2 switches
- Cost-effective solution for mid-sized organizations and branch offices
- Full Power Over Ethernet Plus and baseline Borderless Networks services
- Zero-touch deployment and operations via Catalyst Smart Operations

III. Campus LAN – Compact Switches

Securely and easily deploy services anywhere. These fanless, sleek, compact switches are ideal for spaces with limited wiring and cabling infrastructure, such as kiosks, conference rooms, and call centers.

Cisco Catalyst 3560 and 3560-C Series Compact Switches

- Sleek quiet switches deliver comprehensive access services outside the wiring closet
- Support for Power Over Ethernet Plus, Cisco EnergyWise, and advanced QoS
- Unique PoE pass-through capability eliminates the need for power outlets
- Cisco TrustSec and MACsec support plus Payment Card Industry security compliance
- Zero-touch remote deployment and operations enabled by Catalyst Smart Operations

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IV. Data Center Switches

Build a data center network based on switches that promote Infrastructure scalability, operational continuity, and transport flexibility.

Cisco Nexus 7000 Series Switches

- Highest switching capacity; up to 550 Gigabits per slot, 17.6 terabits per chassis
- Highest 1,10, 40 and 100 Gigabit Ethernet density
- Advanced high availability; hitless In-Service Software Upgrade (ISSU)
- Optimized for highly secure virtualized environments
- Ideal for collapsed data center-campus core deployments

Cisco Nexus 5000 Series Switches

- Facilitates any transport over Ethernet, including Layer 2,3 and SAN traffic
- Ideal for enterprise-class server access layer and mid-market aggregation deployments
- Lowers total cost of ownership by simplifying data center infrastructure
- Enhances business resilience with greater operational continuity

Cisco Nexus 3000 Series Switches

- Ultra-low latency in High Frequency Trading and Big Data environments
- Increased application performance through wire-rate Layer 3 switching
- Options on connectivity speeds from 1 Gigabit Ethernet (GE) to 40 GE
- Simplified management with Python scripting, EEM, and XML tools

Cisco Nexus 2000 Series Fabric Extenders

- Fabric extensibility with single point of management for top-of-rack topologies
- Provides server connectivity for 100 Mb Ethernet, 1 and 10 GE (including 10GBase-T)
- Reduces data center cabling costs and footprint; optimizes inter-rack cabling
- Extends to partner blade servers like HP BladeSystem

Cisco Nexus 1000V Virtual Switch

- Switch that integrates directly with server hypervisors
- Ideal for organizations looking to deploy consistent, policy-based network and security services to all virtual machines
- Delivers virtual machine-aware network services
- Reduces total cost of ownership by providing operating consistency

Cisco Catalyst 6500 Series Switches

- Leading modular campus platform that simplifies operations, reduces network costs, and maximizes existing investments
- Ideal for campus core and distribution, and for data center customers looking to deploy integrated service modules
- High availability with Virtual Switching System
- Integrated service modules for lower total cost of ownership and easy manageability

Cisco Catalyst 4900M Series Switches

- Supports up to 10-Gigabit Ethernet interfaces
- Provides up to 320 Gbps forwarding capacity
- Supports critical routing protocols and IPv6 in hardware
- Features hot-swappable, redundant power supply and fans

V. Service Provider – Aggregation Switches

Cisco Carrier Ethernet switches provide the aggregation and multiplexing layer between access and edge layers.

Cisco ME 3800X Series Switches

- Cost-effective, 1 rack-unit switch router that facilitates broadband, mobile, and Carrier Ethernet aggregation
- Ideal for broadband aggregation, and mobile backhaul applications
- Offers a small footprint, low power consumption, and a high service scale
- Provides a full-featured platform for remote central office and lower-density aggregation

Cisco Catalyst 6500 Series Switches

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Cisco Catalyst 4500E Series Switches

- Highly expandable modular access and price/performance distribution switch
- Ideal for service providers, enterprises, and medium sized businesses
- Application visibility and control with Flexible NetFlow
- High availability with In Service Software Upgrade

Cisco ME 4900 Series Switches

- Addresses next-generation residential services
- High-performance, 1 rack-unit Carrier Ethernet switch
- Ideal for service providers that want to deploy new residential services
- Offers triple play service support (voice, video, and data)
- Industry-leading wire-speed performance of 48 Gbps and 71 mpps

VI. Service Provider– Ethernet Access Switches

Implement class-leading switches featuring application intelligence, unified services, nonstop communications, virtualization, integrated security, and simplified manageability.

Cisco ME 3600X Series Switches

- 1 rack-unit, fixed switch that converges wireless and wireline services
- Ideal for service providers that want to simplify operations and deploy "pay-as-you-grow" business model
- Delivers premium services with hierarchical quality of service
- Provides 10 Gbps transport speed for business and mobile applications

Cisco Catalyst 3750 Metro Series

- Switch that enhances intelligence at the metro Ethernet edge
- Ideal for service providers seeking to deliver residential triple-play services, and business services
- Supports traffic shaping, tunneling, and VLAN mapping
- Offers cost-effective path from current to future service requirements

Cisco ME 3400E Series Switches

- Customer-located Ethernet access switch optimized for business services
- Ideal for service providers that want to offer advanced Ethernet services such as Ethernet-to-the-Business VPN Services
- Offers platform for flexible and differentiated services
- Provides tools to deliver high service availability

Cisco ME 4900 Series Switches

- High-performance Carrier Ethernet aggregation switch
- Ideal for service providers that want to deploy new residential services
- Offers triple play service support (voice, video, and data)
- Industry-leading wire-speed performance of 48 Gbps and 71 mpps

Cisco ME 6500 Series Switches

- 1.5 rack-unit, fixed switch for scalable and service-rich Ethernet access and aggregation networks
- Ideal for deployments in small and remote central offices
- Addresses triple play implementations (voice, video, and data services)
- Delivers high performance, reliability, and quality of service (QoS)

Routers

Benefits

Organizations today want their networks to support all forms of media, as well as new wireless and wired devices. To solve these challenges, networks must contain intelligence, and integrate advanced applications into an adaptable, pervasive, and collaborative system. This approach provides:

- Enhanced productivity through increased video-based collaboration and rich-media services, and optimized application delivery
- Integrated security, where the network becomes the point of control for preventing and responding to security threats
- Mobility that enables workforce to accelerate decision making and collaborate in real time regardless of location

Improve Processes Through a Systems Approach

A systems approach combines packaging with intelligent applications within and between services. It weaves voice, security, routing, and application services together, so that processes become more automated and intelligent. The results include:

- Pervasive security in the network and applications
- Higher quality of service (QoS) for data, voice, and video traffic
- Increased time to productivity
- Better use of network resources
- This approach begins with a single, resilient platform created by Cisco routers. They give organizations of all sizes fast, secure access to today's mission-critical applications, as well as a foundation for growth.

Cisco Routers Provide:

- An integrated systems approach to embedded services that speeds application deployment and reduces costs and complexity
- Embedded security and voice services in a single routing system
- The industry's first portfolio engineered for secure, wire-speed delivery of concurrent data, voice, and video services
- Unparalleled services performance and investment protection
- Gain a Foundation for an Intelligent Network
- In addition to providing a platform that helps optimize the delivery of applications and communications,

I. Branch

Increase the power of the network and optimize branch services on a single platform, while gaining a superior user experience.

3900 Series Integrated Services Router

- Delivers scalable interactive media services, including TelePresence
- Ideal for high-end deployments requiring business continuity, collaboration
- Field-upgradeable motherboard, 350 Mbps circuit-speed WAN performance
- 3 RU modular form factor

2900 Series Integrated Services Router

- Provides interactive media services and service virtualization
- Ideal for mid-range deployments needing business agility and collaboration
- Circuit-speed WAN performance up to 75 Mbps , plus variety of services
- 1-2 RU modular form factor

1900 Series Integrated Services Router

- Entry-level, highly secure, cost-effective solution for WAN deployments
- Ideal for small offices requiring modular flexibility
- Circuit-speed performance up to 25 Mbps with concurrent services
- Desktop form factor

800 Series Integrated Services Router

- Provides secure WAN connectivity with desktop form factor
- Ideal for telecommuters and small offices
- Wire-speed performance with secure data services
- Factory-selectable 802.11n access point and 3G WAN options

II. Wide Area Network (WAN)

Transform your WAN to deliver high-performance, highly secure, and reliable services to unite campus, data center, and branch networks.

ASR 1000 Series Aggregation Services Router

- Industry-leading performance, service capabilities, and reliability
- Ideal for enterprises for private WAN, Internet edge, and WAN aggregation
- Highly secure, high-performance, instant-on services
- Extends network as a platform for cloud computing

Catalyst 6500 Series Switch

- WAN service modules facilitate LAN/WAN consolidation
- Advanced traffic management boosts performance and productivity
- Integrated security services protect critical resources and connected users
- Extensible systems readily adapt to new business and IT demands

III. Service Provider

Differentiate your service portfolio and increase revenues by delivering end-to-end scalable solutions and subscriber-aware services.

Cisco Carrier Routing System

- Offers industry-leading performance and advanced services intelligence
- Ideal for service providers across all market segments
- Scales up to 322 Tbps
- Provides industry-leading efficiency, requiring less power and rack space

ASR 9000 Series Aggregation Services Routers

- Offers nonstop video, enhanced scalability, and reduced carbon footprint
- Ideal for carriers offering residential, mobile and business services
- Scales up to 96 Tbps per system with comprehensive system redundancy
- Offers unique service- and application-level intelligence

ASR 1000 Series Aggregation Services Router

- Industry-leading performance, service capabilities, and reliability
- Ideal for large enterprises and service providers
- Highly secure, high-performance and integrated software-enabled services
- New collaborative and highly secure connectivity features

Cisco XR 12000/12000 Series Router

- Extends highly secure virtualization and integral service delivery
- Ideal for large enterprises and service providers
- Features Cisco I-Flex (PDF - 677 KB), which prioritizes voice, video, and data services
- Offers continuous system operation and multiservice scale

7600 Series Router

- Industry-leading, carrier-class edge router
- Ideal for service providers that deliver consumer and business services
- Provides high-performance capabilities with up to 720 Gbps in one chassis
- Choice of form factors which are purpose-built for high availability

2. Switching/Routing Solution Overview and Benefits

Core / Distribution

Cisco Catalyst 6500

The Catalyst 6500 Series is Cisco premier switching platform that delivers innovations and advanced technologies, superior feature sets, and future-proof architecture. The Cisco Catalyst 6500 is the flagship Platform of the Catalyst Family. The Catalyst 6500 is the benchmark for innovation and investment protection in networking, delivering high performance and a broad feature set suitable for campus, data center, WAN, and Metro Ethernet deployments.

Solution Overview

Available in 3-, 4-, 6-, 9-, and 13-slot chassis configurations, the Catalyst 6500 Series provides operational consistency and reduces TCO by sharing a common set of modules, choice of software, and network management tools thus eliminating the need to purchase, track, maintain and manage separate specialized devices. By seamlessly integrating advanced multigigabit layer 2 through 7 services, the Catalyst 6500 Series optimizes IT infrastructure utilization and maximizes ROI.

The Cisco Catalyst 6500 delivers successive generations of performance increases (32 Gbps backplane, 256 Gbps switch fabric, 720 Gbps switch fabric, 1.4 Tbps VSS capacity, 2 Tbps switch fabric and 4 Tbps VSS capacity) and technology innovations (MPLS and IPv6 in hardware, integrated NetFlow capability, integrated network services, and more). By migrating to the Cisco Virtual Switching Supervisor Engine 2T or the Cisco Virtual Switching Supervisor Engine 720 with 10 Gigabit Ethernet uplinks, The State of Georgia can benefit from the superior capabilities that include:

- **Performance:** Increased system bandwidth up to 4 Tbps using VSS technology; faster packet processing to over 700 Mpps on a DFC4-enabled system; Egress Microflow and Netflow Supervisor 2T features support increased throughput with up to 8K port ACLs and up to 6K Aggregate Policiers
- **Scalability:** Up to 8 times more NetFlow entries; 10 Gigabit Ethernet modules and supervisor uplinks; high 10G line rate port density on Supervisor 2T system

- **Operational management:** Support for EEM and Smart Call Home to allow for proactive support capabilities; support for GOLD to automate the ongoing health monitoring diagnostics process; support for ERSPAN to provide a centralized monitoring infrastructure; increased application visibility with new and enhanced SNMP MIBs and NAM enhancements on the Supervisor 2T
- **Security:** Support for Rate Limiters and CoPP to protect the system CPU; support for enhanced uRPF to protect against spoofed IP attacks; support for a CEF-based architecture to better protect the system from denial-of-service attacks; Line rate encryption on all Supervisor 2T ports plus CoPP, ACLs, and MacSec (IEEE 802.1ae) features
- **QoS:** Provide better application performance and prioritization by controlling network resources through queuing, marking, user-based rate limiting, egress policing and other mechanisms
- **Virtualization:** Support for VSS; support for MPLS, MPLS-VPN, VRF-Lite, and GRE tunneling; Supervisor 2T native VPLS plus overlapping address using VPN aware NAT and guest access to the Internet
- **Multicast:** Support for egress replication to free up forwarding resources for other needs; support for multicast VPN to allow multicast transmission amongst various locations; PIM source registry and Dual RPF in Supervisor 2T hardware saves CPU and memory usage; support for IPv6 Multicast in hardware with Supervisor 2T systems
- **IPv6 readiness:** Provide IPv6 forwarding in hardware; Provide IPv6 tunneling capabilities; IPv6/IPv4 dual stack support; 6PE (IPv6 / MPLS) and 6vPE (IPv6 / MPLS-VPN) support
- **High availability:** Support for eFSU to significantly reduce the downtime during upgrade cycles; 1.4 Terabit VSS using Supervisor 720-10G and 4 Terabit VSS using Supervisor 2T
- **Integrated services support:** Support for ACE, WiSM / WiSM2, FWSM, ASA-SM, NAM-1/2 and VPN-SPA modules; future proofing for next-generation service modules

Benefits

With 4 Terabit VSS, 10 Gigabit Ethernet, industry-leading multicast capabilities, network virtualization, Flexible NetFlow, 4 million counters, per protocol statistics, and IPv6, the Cisco Catalyst 6500 Switching Supervisors, Line Cards, give The State of Georgia the keys to better manage your network. The technology features enhance IT investments through compatibility with existing module and multitier architecture, enable new applications and services, deliver scalable and predictable performance, simplify network operations with a wide range of features, and are ideal for deployments in distribution, core, and data centers in enterprise environments and service provider networks.

Cisco Catalyst 4500

The Cisco Catalyst 4500 E-Series Switches delivers a high-performance, highly secure, and mobile user experience for enterprise wiring closets, access and core layers through innovations in collaboration, security, resiliency, and EnergyWise, with a focus on lowering your total TCO. With more than 500,000 chassis deployed worldwide, the Cisco Catalyst 4500 E-Series Switches are designed for high resiliency and offer maximum investment protection and are compatible with previous and future versions across generations.

Solution Overview

Cisco Catalyst 4500 Series Switches provides a scalable non-blocking Layer 2-4 switching with secure, flexible, non-stop communications, enabling business resilience for enterprises, SMBs, and Metro Ethernet customers deploying business-critical applications. The Cisco Catalyst 4500, offered delivers predictable and scalable high performance, with advanced dynamic QoS capabilities and configuration flexibility for enterprise wiring closets and SMB access and core. Integrated resiliency features in both hardware and software maximize network availability, helping to ensure workforce productivity, profitability, and customer success. The Cisco Catalyst 4500's centralized, innovative, and flexible system design helps ensure smooth migration to wire-speed IPv6 and 10 Gigabit Ethernet. The flexibility, scalability, and forward and

backward compatibility between generations of the Cisco Catalyst 4500 Series extend deployment life, providing exceptional investment protection and reducing TOC.

The Cisco Catalyst 4500 Series includes: Four chassis form factors: Cisco Catalyst 4510R+E and 4510R-E (10 slots), Cisco Catalyst 4507R+E and 4507R-E (7 slots), Cisco Catalyst 4506-E (6 slots), and Cisco Catalyst 4503-E (3 slots). The 4503-E, 4506-E, 4507R+E and 4510R+E chassis, are extremely flexible and support either 6 Gbps or 24 Gbps per line card slot with future upgradeability to 48 Gbps per line card slot. 4507R-E and 4510R-E chassis are limited to 6 Gbps and 24 Gbps per line card slot. The Cisco Catalyst 4500 Series, provides a common architecture, taking advantage of existing Cisco Catalyst 4000 Series line cards, scaling up to 388 Ethernet ports. Offering compatibility with existing Cisco Catalyst 4000 and 4500 Series line cards, the Cisco Catalyst 4500 E Series, extends its window of deployment in converged networks.

The Cisco Catalyst 4500 Series, includes E-series supervisor engine, line cards, and with "classic" supervisor engines, and line cards. The E-Series supervisor engines and line cards provide many enhancements, including 24 Gbps of switching capacity per line card slot and aggregate forwarding performance of 250 million pps. Classic supervisors and line cards deliver 6 Gbps of switching capacity per line card slot and forwarding performance up to 102 million pps.

The Cisco Catalyst 4500 E-Series provides significant performance and services benefits including:

- Higher switching performance with up to 320Gbps and 24Gbps per slot of Layer 2-4 switching. The E-Series chassis is future proof for 48Gbps per slot performance with future supervisor upgrade.
- Hardware IPv6 switching to be ready for future IPv6 migration and deployment.
- Higher services capacity with 128K flexible TCAM resources that allows security and QoS services without performance penalty, and deeper QoS queues for robust delivery of rich media applications.
- IEEE 802.3at (PoE Plus) support provides future proof for future PoE devices, such as next generation IP phone, security camera and thin clients, etc.
- Support 6000 watt power supply for higher density IP Telephony deployment.
- Flexible Gigabit and 10 Gigabit supervisor uplinks to allow easy and smooth migration to campus 10 Gigabit backbone.
- Enhanced energy efficiency with capabilities such as higher power supply efficient (up to 93%), up 70% decline of power consumed per Gbps switching, idle slot optimization and EnergyWise.

Cisco Catalyst Fixed Switches

An Agile delivery of services and applications to provide a new workspace experience is possible with the Cisco Borderless Networks Architecture- a framework to connect anyone, anything, anywhere, anytime securely, reliably and seamlessly. The fixed Cisco switches are a cornerstone of the Borderless Networks Architecture. To enable key network service elements (mobility, energy management, security, application performance, and multimedia optimization), allows the network to deliver the flexibility and advanced functionality required to keep pace with the evolving business needs of The State of Georgia.

Solution Overview

Individually, these switches offer the performance and features required for virtually any deployment, from small workgroups and wiring closets to corporate data centers and network cores. Working together, they are the building blocks of an integrated network that delivers intelligent services from the wiring closet to the core-protecting, optimizing, and growing your network as your business needs evolve.

2960-C & 3560-C Series

The Cisco Catalyst 3560-C and 2960-C Series Compact Switches are small form-factor Fast Ethernet and Gigabit Ethernet switches designed for deployments outside the wiring closet. Enterprise and commercial customers can deliver advanced security services, unified communications, wireless, IP video cameras, and

other applications for the office workspace, micro branch office, classroom, cruise ship, and other wiring-constrained environments.

Key Features:

- Connectivity options:
 - PoE+ up to 30W per port
- Investment protection:
 - Enhanced limited lifetime hardware warranty
 - Cisco EnergyWise to measure, report, and reduce energy usage across your organization
- Security:
 - MAC security hardware-based encryption
- Software versions:
 - Cisco IOS Software IP Services
 - Cisco IOS Software IP Base
 - Cisco IOS Software LAN Base
 - Cisco IOS Software LAN Lite

Cisco 3560-X Series

Enhance productivity when you use the Cisco Catalyst 3560-X Series Switch to enable applications such as IP telephony, wireless, and video. These enterprise-class switches provide high availability, scalability, security, energy efficiency, and ease of operation with innovative features.

Key Features:

- Connectivity options:
 - 24 and 48 10/100/1000 PoE+ and non-PoE models
 - PoE+ with 30W power on all ports in 1 RU form factor
 - Optional four 1 GE SFP or two 10 GE SFP+ uplink network modules
- High availability:
 - Dual redundant, modular power supplies and fans
 - Investment protection:
 - Enhanced limited lifetime warranty
 - Cisco EnergyWise to measure, report, and reduce energy usage across your organization
- Security:
 - MACSec (802.1ae) hardware-based encryption
 - Multicast routing, IPv6 routing, and access control list in hardware
- Ease of use:
 - Cisco Smart Install for immediate availability
 - Cisco Auto Smartports for automatic configuration by device type
- Software versions:
 - LAN Base: Enterprise Access Layer 2 Switching
 - IP Base: Enterprise Access Layer 3 Switching, including OSPF for routed access, IPv4 and IPv6
 - IP Services: Advanced Layer 3 Switching

Cisco 3750-X Series

Enhance productivity when you enable applications such as IP telephony, wireless, and video for a borderless network experience. Cisco Catalyst 3750-X Series Switches are enterprise-class stackable switches. They provide high availability, scalability, security, energy efficiency, and ease of operation with innovative features such as Cisco StackPower, PoE+, optional network modules, redundant power supplies, and MAC security.

Key Features:

- Connectivity options:
 - 24 and 48 10/100/1000 PoE+ and non-PoE models
 - PoE+ with 30W power on all ports in 1 RU
 - Optional four 1 Gb Ethernet SFP or two 10 Gb Ethernet SFP+ uplink network modules
- High availability:
 - Cisco StackPower is an innovative, industry-first feature for sharing power among stack members
 - Cisco StackWise Plus for ease of use and resiliency with 64 Gbps throughput
 - Dual redundant, modular power supplies and fans
- Investment protection:
 - Backward compatibility with Catalyst 3750 Series
 - Enhanced limited lifetime warranty
 - Cisco EnergyWise Technology
- Security:
 - MACsec hardware-based encryption
 - Multicast routing, IPv6 routing, and access control list in hardware
- Ease of use:
 - Cisco Smart Install for immediate availability
 - Cisco Auto Smartports for automatic configuration by device type
- Software versions:
 - LAN Base: Enterprise Access Layer 2 Switching
 - IP Base: Enterprise Access Layer 3 Switching , including OSPF for routed access, IPv4 and IPv6
 - EIGRP stub and Multicast Stub to complement routed access design for either OSPF or EIGRP deployments
 - IP Services: Advanced Layer 3 Switching

Cisco Catalyst 2960 & 2960-S Series

The Cisco Catalyst 2960 and 2960-S Series Switches enable applications such as IP telephony, wireless, and video. These enterprise-class switches provide a borderless network experience that is easy to use and upgrade, as well as highly secure and sustainable.

New 10- and 1-Gigabit Ethernet models offer uplink flexibility and help business continuity and fast transition to 10-Gigabit Ethernet.

Key Features

- Connectivity options:
 - 24 and 48 10/100/1000 PoE+ and non-PoE models (2960S)
 - 24 and 48 10/100 PoE and non-PoE models (2960)
 - PoE+ with up to 30W per port (2960-S)
 - Four 1 Gb Ethernet SFP or two 10 Gb Ethernet SFP+ uplinks (2960-S)
- Ease of use:
 - Cisco FlexStack stacking for ease of operation with Cisco Catalyst Smart Operations
 - Cisco Smart Install for immediate availability
 - Cisco Auto Smartports for automatic configuration by device type
- Investment protection:
 - Enhanced Limited Lifetime Warranty
 - Cisco EnergyWise technology
 - Low power consumption on 2960-S Series

- Security:
 - Superior Layer 2 threat defense capabilities
- Routing:
 - Basic Layer 3 static routing with 16 routes

Cisco Catalyst 3560 v2 Series

The Cisco Catalyst 3560 v2 Series are energy-efficient, Layer-3 fast Ethernet switches. This series of switches supports Cisco EnergyWise. The Cisco Catalyst 3560 v2 Series, offered by consumes less power than its predecessors and is the ideal access layer switch for enterprise, retail, and branch-office environments, as it maximizes productivity and investment protection by enabling a unified network for data, voice, and video.

Key Features

- Connectivity options:
 - 24 and 48 10/100 PoE and non-PoE models
 - 2 SFP or 4 SFP Gigabit Ethernet uplink ports
- High availability:
 - DC powered stand-alone model
- Investment protection:
 - Lower power consumption than its predecessors
 - Cisco EnergyWise support
 - Compatible with Cisco RPS 2300
- Software versions:
 - Backward compatible uses the same Cisco IOS Software image as the 3560 series and has the same feature set
 - Preconfigured with the Cisco IOS Software release at the time of ordering
- Routing:
 - IPv6 routing included in the IP Base feature set
 - OSPF for routed access

Data Center Switching

Cisco Nexus 7000

As the State of Georgia increasingly relies on IT to help enable, and even change, your business strategies, the IT infrastructure will need to be more powerful, agile, and efficient. Today's enterprises require continual system availability, demand ubiquitous access, and expect rapid and fluid response to their ever-changing business needs. The Cisco Nexus 7000 Series of data center-class switches meets the business challenge and takes advantage of emerging opportunities in a way that protects their current infrastructure investment and allows them to incrementally incorporate new capabilities in a granular, cost-effective manner.

Solution Overview

The Cisco Nexus 7000 Series delivers an innovative architecture to simplify data center transformation by enabling a high-performance, standards-based Ethernet unified fabric. The platform consolidates separate LAN, SAN, and server cluster network environments into a single unified fabric. The Cisco Nexus 7000 Series Switch is designed to meet the challenges of next-generation data centers, including dense, multi-socket, multi-core, virtual machine-optimized environments, where infrastructure sprawl and demanding workloads are commonplace.

A modular switch available in 10-slot and 18-slot configurations, the Cisco Nexus 7000 Series is capable of more than 15 Tbps of switching capacity and offers market-leading Gigabit Ethernet and 10 Gigabit Ethernet densities with support for DCB.

Key Features

- Support for up to 230 Gbps per slot.
- Zero-service-loss hardware and software architecture.
- Fiber channel-like high availability to properly support storage services.
- Integrated lights-out management, packet capture, and decoding.
- Innovative switch virtualization capabilities.

Cisco NX-OS Software

Cisco NX-OS, available through is a data center-class operating system built to meet the demands of the virtualized data center. Cisco NX- OS for Cisco Nexus 7000 maintains consistency with the rest of the Cisco Nexus Family while delivering features critical to data centers such as a modular, flexible architecture, continuous system availability, and switch virtualization capabilities.

Key Features

- **Unified data center operating system:** Cisco NX-OS, available through runs on the Cisco Nexus 7000 Series Switch, Nexus 5000 Series Switch, Cisco MDS Series Multilayer SAN Switch, and Cisco Nexus 1000V virtual switch for VMware ESX.
- **Robust and rich feature set with a variety of Cisco innovations:** Based on industry-tested IOS Software, Cisco MDS 9000 SAN-OS Software has the acquisitions to unify data center operations.
- **Flexible and scalable:** Built with modularity, virtualization, and resiliency at its core.
- **IP routing and multicast:** Supports state-of-the-art implementations of IPv4 and IPv6 services, routing protocols, and IP Multicast features.
- **Comprehensive security, availability, serviceability, and management features:** Meetings the challenges of the most demanding environments.

Benefits

As the flagship switch in the next generation of switch platforms, the Cisco Nexus 7000 provides integrated resilience combined with features optimized specifically for the data center for availability, reliability, scalability, and ease-of-management. Designed to meet the high-demanding requirements of data centers, it delivers continuous system operation and virtualized, pervasive services. The Cisco Nexus 7000 Series is based on a proven operating system with enhanced features to deliver real-time system upgrades and exceptional manageability and serviceability. Its innovative design is purpose-built to support end-to-end data center connectivity, consolidating IP storage and IPC networks onto a single Ethernet fabric. The Cisco Nexus 7000 Series provides:

- Improved productivity
- Increased business agility
- Enhanced business resilience
- Optimized service levels
- Isolated applications, departments, and customers
- Reduced data center resources requirements

Cisco Nexus 5000 Series

As part of the Cisco Nexus family of data center-class switches, the Cisco Nexus 5000 Series delivers an innovative architecture to simplify data center transformation by enabling a high-performance, standards-based Ethernet unified fabric. The platform consolidates separate LAN, SAN, and server cluster network environments into a single unified fabric. The Cisco Nexus 5000 Series is designed to meet the challenges of next-generation data centers, including dense, multi-socket, multi-core, VM-optimized environments, where infrastructure sprawl and demanding workloads are commonplace.

Solution Overview

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The Cisco Nexus 5500 platform extends the industry-leading versatility of purpose-built, 10-GE data center class switches and provides higher density, lower latency, and multilayer services. The Cisco Nexus 5500 Platform is well suited for enterprise-class data center server access layer deployments and smaller scale, mid-market data center aggregation deployments across a diverse set of physical, virtual, storage access, and high-performance compute data center environments.

All the rich features of the Cisco Nexus 5000 platform include:

- Custom ASICs provide up to 960 Gbps non-blocking throughput and up to 48 ports in a 1RU solution and up to 1.92 Tbps non-blocking throughput and up to 96 ports in a 2RU solution.
- NX-OS supports standards based unified fabric switching based on DCB innovations, full L2 switching capabilities, and L3 routing functions including IGP and BGP.
- The Cisco Nexus 5500 Switch has a modular design with its unified port feature, allows users to configure via software any port to any service, with any speed. Due to the innovative PHY-less design of the ports and the robust NX-OS, the 5500 series can support 1/10G Ethernet, 10G FCoE, or 1/2/4/8G FC with the desired type of transceiver plugged in.

Cisco Nexus 5596 UP

The Cisco Nexus 5596UP Switch is the latest of the Cisco Nexus 5500 Platform. It is a 2RU 10-GE, and FCoE switch offering up to 1.92 Tbps throughput and up to 96 ports. The switch has 48 1/10-Gbps fixed SFP+ Ethernet and FCoE ports and three expansion slots.

Features include

- Unified ports support traditional Ethernet, FC, and FCoE
- Connectivity options include Gigabit, 10 Gigabit (fiber and copper), FC, and FCoE
- Provides support for all Cisco Nexus 2000 Series Fabric Extenders

Cisco Nexus 1010 Switch

The Cisco Nexus 5010 1RU switch provides an Ethernet-based unified fabric designed to meet your specific server networking needs. It delivers more than 500 Gbps of switching capacity with 20 fixed wire-speed 10-GE ports that support data center bridging and FCoE. In addition, one expansion port supports one of the following modules:

- 8-port 1/2/4 Gigabit Fibre Channel
- 6-port 1/2/4/8 Gigabit Fibre Channel
- 4-port 10 Gigabit Ethernet (DCB and FCoE) and 4-port 1/2/4 Gigabit Fibre Channel
- 6-port 10 Gigabit Ethernet (DCB and FCoE)

The Cisco Nexus 5010 Switch foundation is built upon:

- High-performance 10 Gigabit Ethernet
- IEEE DCB for lossless Ethernet
- FCoE
- VM-optimized networking

Cisco Nexus 5020 Switch

The Cisco Nexus 5020 2RU switch delivers an Ethernet-based unified fabric to meet your specific server networking needs. It also delivers more than 1 Tbps of switching capacity with 40 fixed, wire-speed, 10-GE

ports that support DCB and FCoE. In addition, two expansion ports support any combination of the following modules:

- 8-port 1/2/4 Gigabit Fibre Channel
- 6-port 1/2/4/8 Gigabit Fibre Channel
- 4-port 10 Gigabit Ethernet (DCB and FCoE) and 4-port 1/2/4 Gigabit Fibre Channel
- 6-port 10 Gigabit Ethernet (DCB and FCoE)
- The Cisco Nexus 5020 Switch foundation is built upon:
- High-performance 10 Gigabit Ethernet
- DCB
- FCoE
- VM-optimized networking

Cisco 5548UP Switch

The Cisco Nexus 5548UP Switch is the first of the Cisco Nexus 5500 Platform. It is a 1RU, 10-GE, and FCoE switch offering up to 960 Gbps throughput and up to 48 ports. The switch has 32 1/10-Gbps fixed SFP+ Ethernet and FCoE ports and one expansion slot.

The expansion modules include:

- 16-port 1G/10Gbps SFP+ Ethernet/FCoE
- 8-port 1G/10Gbps SFP+ Ethernet/FCoE, plus 8-port 1/2/4/8Gbps Native FC
- 16-port unified port module 1G/10G Ethernet/FCoE, 1/2/4/8Gbps Native FC

As part of the Cisco Data Center Business Advantage, the Cisco Nexus 5548UP Switch delivers these IT and business advantages:

- Unified ports support traditional Ethernet, FC, and FCoE
- Connectivity options include Gigabit, 10 Gigabit (fiber and copper), FC, and FCoE
- Provides support for all Cisco Nexus 2000 Series Fabric Extenders

Cisco Nexus 2000 Series Fabric Extender

The Cisco Nexus 2000 Series Fabric Extenders comprise a category of data center products that provide a universal server-access platform that scales across a multitude of 1-GE, 10-GE, unified fabric, rack, and blade server environments. The Cisco Nexus 2000 Series Fabric Extenders are designed to simplify data center architecture and operations by meeting the business and application needs of a data center. Working in conjunction with Cisco Nexus switches, the Cisco Nexus 2000 Series Fabric Extenders offers a cost-effective and efficient way to support today's Gigabit Ethernet environments while allowing easy migration to 10-GE, VM-aware Cisco Unified Fabric technologies.

Features include

- 2148: 48port 1G with 4 x 10G uplinks to parent Cisco Nexus 5000
- 2224: 24port 100M/1G with 2 x 10G uplinks
- 2248: 48port 100M/1G with 4 x 10G uplinks
- 2232: 32port 1G/10G FCoE with 8 x 10G uplinks

Benefits

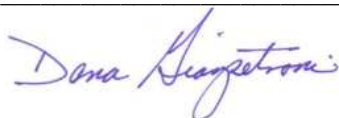
The Cisco Nexus 5000 Series can help you start realizing the benefits inherent in the Cisco Data Center Business Advantage vision. The Cisco Nexus 5000 Series is a family of access switches designed to deliver the consolidation and bandwidth you need today. Backed by a broad ecosystem of industry-leading technology and with its innovative architecture that enables a standards-based, Ethernet unified fabric, the Cisco Nexus 5000 also simplifies future data center transformations.

The Cisco Nexus 5000 Series, proposed by can provide The State of Georgia with a range of substantial benefits that prove its lasting value including:

- Greater business agility
- Enhanced business resilience
- Optimized service levels
- Simplified data center infrastructure
- Optimized data center consolidation

3. Investment in Research and Development

Cisco has one of the largest R&D budgets industry wide and is committed to continual innovation and improvement. Since the inception of the router which changed networking forever, Cisco has never stopped innovating. While many companies have focused on making one product better, Cisco continues to make their entire product line excel in performance, capacity, and ease of management. Not only is growth driven within the company, but Cisco employees sit on many of the industry standard boards such as IEEE to help drive the entire industry into better, faster, and more efficient standards and solutions globally. Cisco is never satisfied with the way it has always been, and continues to push in new and extraordinary ways to improve and provide solutions the industry has never seen. Cisco is the proven leader that the rest of industries focuses on and works to follow as best they can.



Signature of Authorized Representative

February 28, 2012

Date

Dana Giampetroni, Director of Finance

Name and Title