

# Customized Business Solutions



Created especially for:  
*St. Charles Parish Public Schools*  
On  
*January 14<sup>th</sup>, 2013*

By  
**Vincente Borerros**  
*Education Account Manager*

504 358 6768 direct  
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[www.coxbusiness.com](http://www.coxbusiness.com)



## Welcome - Cox Business Solutions

January 14<sup>th</sup>, 2013  
Ms. Stephanie Steib  
Director of Information Technology Services  
St. Charles Parish Public Schools

Dear Ms. Stephanie Steib,

On behalf of Cox Business, I am pleased to have this opportunity to assist the St. Charles Parish Public Schools in designing the very best telecommunications package for its operations. I have enclosed our customized solution to address your needs as outlined in your RFP.

Cox Business is a full-service, facilities-based provider of advanced communications solutions, offering a complete portfolio of high-speed voice, data, internet, video and local area network services to more than 275,000 business customers across the United States. We want to earn your business and the opportunity to serve the St. Charles Parish Public Schools for many years to come.

Please don't hesitate to call me at 504-358-6768 if I can be of service.

Sincerely,

**Vincente Borerros**  
*Government and Education Account Manager*

504 358 6768 direct  
[vincentee.borerros@cox.com](mailto:vincentee.borerros@cox.com)  
[www.coxbusiness.com](http://www.coxbusiness.com)



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Cox Business has participated in the E-rate Program since 1998 and has provided services in Louisiana since 1996. Cox Business has participated in many major projects related to fiber optic based transport, Metro E and Internet services. Some of our current Metro E and/or internet projects funded by E-rate include: The Recovery School District, St. Bernard Parish School Board, Algiers Charter Schools, Jefferson Parish Public Schools, St Martin Parish School Board, Iberville Parish School Board, East Baton Rouge Parish School Board and Vermillion Parish School Board.

Some other major fiber optic Metro E and/or Internet projects are: Jefferson Parish Sheriff's Office, St. Bernard Parish Sheriff's Office, City of Baton Rouge, City of Zachery, Audubon Institute, Electronic Arts, Zachary Community Schools, Venue and CMA Communications.

All locations will have a state of the art, all fiber optic network into each required premise that will be capable of supporting service levels up to 10 Gbps and beyond. Cox is fully prepared to support a mix of speeds at the remote sites. Some providers may offer networks that are less expensive, but that are often single strand connections and not ring in ring networks like Cox Business. Cox has networks in place for school boards very similar to St. Charles Parish Public Schools all across South Louisiana, and indeed all across the United States. We feel confident that the Metro E services requested in the 470 will well serve the students, teachers and administrators in the St. Charles Parish Public Schools in both the near term and far into the future.

However, the true value of having Cox Business as your partner in educational excellence is in our commitment to making sure that our part of the solution is always ready to meet your needs. As we all know, the need for ever better technology to address learning challenges is only increasing. Cox Business is ready for the challenge with fiber optic infrastructure that can handle over 10 Gbps and electronics that are field upgradable to 10 Gbps service levels.

Cox Communications is a broadband communications and entertainment company, providing advanced digital video, Internet and telephone services over its own nationwide IP network. The third-largest U.S. cable TV company, Cox serves more than 6 million residences and businesses. Cox Business is a facilities-based provider of voice, video and data solutions for commercial customers, and Cox Media is a full-service provider of national and local cable spot and new media advertising.

Cox is known for its pioneering efforts in cable telephone and commercial services, industry-leading customer care and its outstanding workplaces. For seven years, Cox has been recognized as the top operator for women by Women in Cable Telecommunications; for five years, Cox has ranked among DiversityInc's Top 50 Companies for Diversity, and the company holds a perfect score in the Human Rights Campaign's Corporate Equality Index. More information about Cox Communications, a wholly owned subsidiary of Cox Enterprises, is available at [www.cox.com](http://www.cox.com) and [www.coxmedia.com](http://www.coxmedia.com).



Cox Business leads all multiple system cable operators (MSOs) in delivering commercial telecom solutions to over 275,000 small and regional businesses, including healthcare providers, K-12 and higher education, financial institutions and federal, state and local government organizations. Among MSOs, Cox Business is also the leading marketer of Ethernet services, and the first cable provider in North America to deploy a fully-owned and managed IP telephony service that addresses the needs of small businesses and corporations.

## The Difference - Cox Business Solutions



### **Local Presence** 22,000+ Employees Nationwide

Each of the Cox Business markets is recognized as a separate entity with its own executive team and infrastructure for support. Total accountability is positioned where it should be – closest to your firm to ensure delivery of total satisfaction.

### **Total Telecom Solutions** Voice, Data, Video, Internet, Email & More

Cox's full spectrum of high-speed voice, data, Internet, and video services is designed with a multitude of speed, functionality, and application options. Cox Business offers its clients a one-stop shopping environment and turnkey implementation process.

### **Proven Experience** 275,000+ Business Customers

Cox's large base of Ethernet clients, 275,000+ commercial accounts, and more than 6 million consumers, provides clear evidence of the ability of Cox Communications to effectively deliver telecom solutions to your business.

### **Network Redundancy** Fiber Ring Architecture

Our "ring-in-ring" network architecture employs diverse paths so that in the event of a fiber cut, transmissions are automatically routed to the backup fiber path without interruption to your business.

### **Network Reliability** 99.99+% Network Reliability

Different than non-facility based firms, Cox assumes total account-ability for managing every aspect of its nationwide IP network, including a 24/7 Network Operations Center. In recent years Cox has invested more than \$14.6 billion on infrastructure upgrades to deliver video, phone, and high-speed Internet

### **Financial Strength** High Growth Company

Strong revenue and profitability position Cox Business to invest in the right technology, support, and resources to serve your business with the quality and care that it deserves. Since its inception, each year Cox Business has achieved double-digit growth. This track record along with impressive corporate earnings should provide an extra measure of comfort that Cox will be there when you need us most.

### **Customer Satisfaction** Cox Core Value, Industry Recognized

Whether it is bundling voice, IP, data, and video capabilities into a single solution or managing the total requirements of your network, Cox takes the position of end-to-end service responsibility. This means no third party integrations to blame and no "buck passing," just responsiveness, straightforward answers, and increased focus and speed on issue resolution.



## COST



Each location on the network will have a cost for the WAN connection. This cost will be determined by bandwidth selections made by the district (100 mbps, 250 mbps, 500 mbps, 1 Gbps or higher). Cox will deliver an edge device into the demarcation point at each location that will connect to a district supplied and managed router. This edge device is an Alcatel Lucent 7210SAS-M. This equipment is the property of Cox Business and will remain the property of Cox Business.

There will be no associated installation cost for any site. Each site's WAN connection will be delivered to the district's existing demarcation point. The monthly recurring cost (MRC) is e-rate eligible in the telecommunications category.

During the term of an agreed upon contract, the vendor must make available to St. Charles Parish Public Schools all similar contracts utilizing like services and volumes, like access costs, and terms and conditions that are made available to other customers in the state of Louisiana.

### **Cox Response**

Cox's proposal contains highly competitive pricing and Cox looks forward to the opportunity to serve the Parish. Cox notes that it individually prices its services to each customer based upon a multitude of factors including type, quality, and quantity of services ordered, geographic location, installation or construction costs and the terms and conditions of the parties' contract. As the pricing and contract terms are tailored for each customer based upon these factors, Cox cannot adequately compare and make available other customer contracts. Moreover, there are significant legal and privacy concerns in producing other customer's contracts. Therefore, the solicitation's requirement that the vendor must make available all similar contracts to the Parish shall not apply. Cox will work with the SCPPS in good faith to address any concerns with this provision.

If any pricing is for scalable and/or burstable service you must provide a narrative explaining the service and notate that on the cost sheets.

### **Cox Response**

Cox does not offer any burstable service at this time. If such service becomes available the customer can upgrade to that service without extending the term of the contract. The Internet is scalable and can be upgraded for short periods of time. This is done by many school districts that feel more bandwidth is necessary at critical times. As an example if the district selects 500 Mbps of Internet access and would like to upgrade to 1 Gbps of Internet access for end of course testing they would simply have to place an order with their assigned account executive at least two weeks prior to the anticipated need. The district will be asked to pay the difference between 500 Mbps and 1 Gbps for a single month.

Your costs should be based upon a 36 month contract.

### **Cox Response**

Cox agrees that the pricing offered is based upon a 36 month contract.

# NETWORK ARCHITECTURE



## General Information on Cox Metro Ethernet

The Cox Business Metro Ethernet product is a premier WAN technology for 21<sup>st</sup> century enterprises that require reliable, private, high speed connections between multiple locations. Some of the main benefits of Cox' Metro Ethernet is that it allows the customer unparalleled options for:

- Resiliency and Redundancy
  - Metro Ethernet is available with true ring access and with dual entry for complete ring diversity upon customer request.
  - Multipoint / mesh / cloud topology upon request for true any-to-any connectivity with no single point of failure due to a single customer site becoming unreachable.
  - Cox owns all of its own last mile fiber, so there is truly only one party to deal with or even be concerned about for service delivery, augments and repairs, billing, etc.
  - Cox core facilities are located in hardened buildings, powered by industrial class 48v batter power supplies, kept under constant charging/conditioning by utility power and backed up by auto starting generators.
  - Core network connections between core routers in a single Cox facility and between Cox facilities are made with minimum 10 Gbps connections.
  - Infinera brand Dense Wave Division Multiplexing (DWDM) gear in place in Cox core facilities for nearly unlimited bandwidth connections between core facilities in the local market as well as onto the Cox national backbone.
- Circuit Types
  - Ethernet Private Line (EPL) – Each Ethernet Virtual Circuit (EVC) is a point to point private connection with it's own distinct User Network Interface (UNI) or port at each site.
  - Ethernet Virtual Private Line (EVPL) - Each EVC is a point to point private connection with it's own distinct User Network Interface (UNI) or port at one end (i.e. remote office), and a common (multiplexed) UNI at other end (i.e. main office). Multiple EVC's terminating on the single UNI are logically separated by 802.1Q VLAN tagging.
  - Ethernet Private LAN (EP-LAN) – Each EVC connects to multiple sites for true any-to-any WAN connections. Access data rate per site selectable by customer.
- Flexibility
  - Layer 2 ethernet connections between sites, completely agnostic to upper layer protocols.
  - Metro Ethernet is a WAN access technology, not a LAN technology. It is highly recommended that customer utilize his/her own routers at the edge to break up layer 2 broadcast domain. Another benefit of Metro Ethernet as a WAN technology is the Total Cost of Ownership for Customer Edge (CE) routers is often substantially reduced by eliminating the requirement for expensive TDM cards and modules that are often complex to configure.
  - Compatible along-side other WAN technologies where dual providers are required for redundancy.
  - Frame size from 2000 byte MTU to Jumbo Frames (jumbo available upon request, and may not be available on all circuits).
  - Customer Priority Class of Service for real time (voice or video) traffic to be prioritized over best-effort data.



# NETWORK ARCHITECTURE



- Q-in-Q access on EPL and EP-LAN topologies for customer VLAN trunking between sites.
- All access speeds of 10Mbps and over are provisioned on Cox' own fiber network.
- All initial installations of 10 Mbps access or more are capable of upgrading up to 1 Gbps with either "zero-touch / office-only" processing or simple field upgrades.
- Upgrades to access speeds higher than 1 Gbps (up to 20 Gbps).
- Bandwidth upgrades available much more rapidly than standard ILEC and CLEC offerings.
- Underlying technologies are Ethernet based, not Ethernet emulation overlaid upon TDM backbones for greater flexibility

The bandwidth for each circuit will be determined after reviewing proposals. The vendor must allow the school district to select bandwidth per circuit based upon the needs of the given location.

## **Cox Response**

Cox agrees that the school district must select the band width necessary for each location.

Provide network diagrams and describe the design, including transport speeds, for each of your locations as well as the district's locations. Be very specific and include all of the protocols that will be used.

## **Cox Response**

See attached network diagram indicating services and typical fiber ring deployment attached.

Cox Business will utilize our in-place Alcatel Lucent (ALU) MPLS based core network as the primary component of the network services. The heart of the network will be the local Cox hub in St. Charles Parish which houses the dual ALU 7750 routers in multi-chassis protection mode. Each 7750 has multiple 10G connections to the rest of the network core, dual 10G connections between each other and each side of each customer ring connects to a different box. Each 7750 is also provisioned with multiple 48v DC power supplies and multiple processor engines for "five 9's" of core network reliability.

Premise devices will be Alcatel Lucent 7210 SAS-M devices utilizing MPLS technologies to provide Metro Ethernet Forum (MEF) compliant Ethernet services as shown in the network diagram. The 7210 at the School Board Office will be installed from the start with dual 10G connections on a 10G ring to the Cox Hub and will be available with up to two customer facing 10G fiber Ethernet connections and up to twenty three 1 Gbps fiber or copper interfaces.

Cox' implementation of the Alcatel Lucent MPLS platform allows full use of both sides of the ring. When a failure (i.e. fiber cut) occurs, services will automatically fail over to the protection route with no impact to the customer. In some cases, some services may suffer a slow down of data rate, but in most cases customers never see an impact.

# NETWORK ARCHITECTURE



Cox uses standard QOS mechanisms to ensure Metro Ethernet WAN connections receive a very high priority in the core network (i.e. in all cases higher than best-effort traffic such as Internet access), but specifics on QOS technologies, implementations and interface utilization ratios is considered proprietary and confidential. However, we can safely say that with our DWDM technologies at the very core of our network and our exclusive use of 10 Gbps connections on core devices, we make every effort to either not over-subscribe our links, or at the very least ensure that the link utilization and QOS mechanisms in place provide the customer with the rated speed at a very low latency and minimal jitter at all times.

The port size of the common (multiplexed) UNI at the School Board Office shall be sized such that the ratio of aggregate EVC (circuit) bandwidths and port bandwidth shall be 1:1. We recommend that customer be prepared to accept at minimum one 10 Gbps interface for those 18 circuits. The multiple circuits terminating on a single, multiplexed port shall conform to the Ethernet Virtual Private Line service type.

For example, should customer select 18 – 500 Mbps circuits, the aggregate bandwidth required at the School Board Office would be 9 Gbps. Cox would be prepared to hand off 18 discrete 1 Gbps ports or one multiplexed 10 Gbps interface. Or should customer select 1 Gbps circuits to the 18 remote schools, Cox would be prepared to offer two 10 Gbps connections. Customer may select to use the dual 10 Gbps connection as stand-alone connections or in a LAG group for an aggregated 20 Gbps connection.

The three 1 Gbps circuits requested to be stand-alone point to point circuits shall have their own ports (one each) at the School Board Office and will conform to the Ethernet Private Line service type. The Dedicated Internet Access circuit shall likewise be delivered on its own stand-alone port.

Customer facing 1 Gbps interfaces may be copper/RJ45, multi-mode fiber (MMF) with LC connections (recommended), or single mode fiber (SMF) with LC connections. 10 Gbps connections shall be multi-mode fiber with LC connections.

Describe the medium that you will be using to deliver the network.

## **Cox Response**

All media for Cox network connections will be single mode fiber. No copper or metallic connections are used except for power connections. Media for customer connections may be either multi-mode fiber (MMF) or copper/RJ45. Single mode fiber (SMF) handoffs are available as well upon request.

# NETWORK ARCHITECTURE



The handoff at each remote site will be Ethernet. Please describe how you will provide this connection. What type of equipment and connector will be provided at all points of demarcation, including the host site? (Ex: ST, SC, etc.)

## **Cox Response**

No copper or metallic connections are used except for power connections. Media for customer connections may be either multi-mode fiber (MMF) or copper/RJ45. Single mode fiber (SMF) handoffs are available as well upon request. Premise devices will be Alcatel Lucent 7210 SAS-M devices utilizing MPLS technologies to provide Metro Ethernet Forum (MEF) compliant Ethernet services as shown in the network diagram. The 7210 at the School Board Office will be installed from the start with dual 10G connections on a 10G ring to the Cox Hub and will be available with up to two customer facing 10G fiber Ethernet connections and up to twenty three 1 Gbps fiber or copper interfaces.

Please provide all information for the district's site as it pertains to edge devices, space, and electrical requirements.

## **Cox Response**

Power required at each site shall be a single NEMA 110VAC, standard 15 amp electrical outlet. Customer is required to provide UPS battery backup protection. DC powered units with integrated rectifier / battery are available upon request. Power consumption: 60W nominal. ALU 7210's may be rack mounted or wall mounted.

### ***Dimensions***

- Height: 67 mm (2.64 in.) – 1.5RU
- Width: 436 mm (17.17 in.)
- Depth: 253 mm (9.96 in.)

# NETWORK ARCHITECTURE



The district is currently utilizing AVAYA communications equipment throughout its infrastructure. Give specific details as to the compatibility of your network devices with the district's networking equipment.

## **Cox Response**

St. Charles Parish Public Schools' Avaya communications system will be able to operate with unmatched quality and efficiency on the Cox solution for 2 reasons:

1. Our service offering is designed to provide the customer a 1:1 ratio of circuit demand to port available bandwidth. We are essentially engineering your present bottleneck out of the equation. The best QOS/COS mechanisms in the world are always inferior to simply not having a bottleneck in the first place. This is not to be confused with our network QOS mechanisms, which are always in place.
2. Cox offers a strict priority queue for real time traffic just in case you are not able to accept 10 Gbps interfaces at this time. Customer traffic may be tagged at layer 2 with the 802.1p field of the 802.1Q VLAN tag or at layer 3 with DSCP. The tag value can match customer's in place QOS mechanisms. Of course, customer must prioritize traffic leaving its own routers sent to Cox. Hierarchical/dynamic, multi-queue QOS mechanisms are in development and will be available in the near future, although exact dates of availability are not available at this time.

# SUPPORT and QUALIFICATIONS



Cox Louisiana Telcom, LLC is a licensed telecommunications carrier. Cox Louisiana Telcom, LLC is registered with the SLD, School and Libraries Division, and the SPIN, service provider identification number is 143016765. Cox Louisiana Telcom, LLC has a SPAC, Service Provider Annual Certification, on file with SLD, School and Libraries Division.

Cox Louisiana Telcom, LLC has filed a 499A declaring the company to be a telecommunications provider. The 499 filer ID, 827138, is on file and Cox Louisiana Telcom, LLC is registered with the Louisiana Public Service Commission.

Cox Business employees 1600 people in the State of Louisiana. There are three main offices in Louisiana including the New Orleans, Baton Rouge and Lafayette areas. All of these main offices house engineers that are very highly qualified and knowledgeable about the Cox Network. Currently Cox Business is in good standing with the SLD and the GSA. Cox Business is an SLD green light company. Cox Business understands that the service will be an Information Service and therefore will be provided by Cox Communications Louisiana.

Cox Business owns and operates a Tier 2 national fiber optic backbone network, peered directly with other Tier 1 and Tier 2 providers. We also operate our own local "last mile" network that is 100% owned, operated and maintained by Cox.

The entire wide area network (including dedicated internet access) requires 24 X 7 monitoring and management. Provide a detailed description of the monitoring and management that will be provided in this contract.

## **Cox Response**

Cox offers superior local and comprehensive service 24/7. Cox has local on call technicians, engineers, and managers available 24 hours a day 7 days a week. In addition, Cox has a Network Operations Center (NOC) that monitors its Network on a 7x24 basis. The NOC also serves as the trouble reporting point for all troubles on the entire network. When an alarm is posted the NOC begins remote testing, if the alarm is not resolved in 15 minutes a local on call tech support person is notified and local trouble shooting begins. The local on call support will contact the local engineering team to begin tier 2 trouble shooting and contact the local customer POC.

Provide information regarding your company's service assurance. Include your service level agreements. In the event of a network outage at any site, state the maximum length of time before assessment or repairs will begin. Any outage greater than 24 hours will be subject to monetary penalty.

## **Cox Response**

Please see the attached SLA. Cox does provide monetary penalty for outages greater than 24 hours. In the event Cox receives a Trouble Report from Customer, Cox will initiate action to clear the trouble within 30 minutes. If the Trouble Report is the result of an electronic component failure, the maximum restoration time is 4 hours. If the Trouble Report is the result of a fiber optic cable failure, the maximum restoration time is 8 hours.

Describe your repair process which includes the steps taken for submitting, escalating, and tracking troubles toward resolution.

## **Cox Response**

Cox shall maintain a twenty-four (24) hour, seven (7) day a week point-of-contact for Customers to report Service troubles, outages or Service Interruptions. Customer shall call Trouble Reports to 866-396-3947. A "Trouble Report" means any report made by Customer relating to the Services or the equipment provided by Cox. Cox Business has local administrative and technical personnel to serve St. Charles Parish Public Schools. Once a technical problem is reported and a ticket number is issued a tech will be dispatched within two hours.

Indicate the local resources available to provide support to the district, including but not limited to the number of local technicians available for network and equipment installation, troubleshooting, and repair.

## **Cox Response**

Cox Business employees 1600 people in the State of Louisiana. There are three main offices in Louisiana including the New Orleans, Baton Rouge and Lafayette areas. All of these main offices house engineers and technicians that are very highly qualified and knowledgeable about the Cox Network.

Once the network is installed, describe the procedures and capabilities for adding new sites, moving locations, or any other infrastructure changes to the network.

## **Cox Response**

Once the network is installed if the district would like to add a site they would contact their sales person. Once this is done a site survey will be initialized and cost will be assessed. A onetime installation fee may or may not be required as determined by the site survey. If a site is moving the same process will have to be followed.

Explain what access the district will have to statistics regarding utilization and performance of the dedicated internet access circuit and wide area network. List any monitoring tools that will be provided to the district.

## **Cox Response**

Currently customers request a band width utilization report on their internet circuit. This report can be generated, by request, monthly.



## SUPPORT and QUALIFICATIONS



Describe the various resources within your company that will assist in executing this network. Provide information on your company's project management process, including proficiency in coordinating implementation, resources, and communications

### **Cox Response**

Cox uses a proprietary project tracking system named OPTIX, Online Project Tracking & Information Exchange. This system allows all levels of Cox to monitor the status of each and every project. This system is in use by Cox Nationally. Cox will also hold weekly or bi-weekly conference calls to assess the progress of the network installation. Last year Cox installed 89 sites for East Baton Rouge Parish School Board and 80 sites for the Jefferson Parish School Board in a 4 month period.

Provide information on the expertise and certifications of your company and employees to design, implement, and maintain the equipment and services proposed.

### **Cox Response**

Each Cox Technician and Engineer is certified by the equipment manufacture for expertise in use and maintained of the equipment. In addition, each certification is refreshed annually.

Provide a copy of your Certification to operate as a Telecommunication Service Provider in the State of Louisiana.

### **Cox Response**

Cox Louisiana Telcom, LLC has filed a 499A declaring the company to be a telecommunications provider. The 499 filer ID, 827138, is on file and Cox Louisiana Telcom, LLC is registered with the Louisiana Public Service Commission. The Certification to operate as a Telecommunication Services Provider is attached in the appendix.

Provide the E-rate SPIN number(s) that your company uses in Louisiana.

### **Cox Response**

Cox Louisiana Telcom, LLC is a licensed telecommunications carrier. Cox Louisiana Telcom, LLC is registered with the SLD, School and Libraries Division, and the SPIN, service provider identification number is 143016765. Cox Louisiana Telcom, LLC has a SPAC, Service Provider Annual Certification, on file with SLD, School and Libraries Division.

The circuits must be in place and operational on July 1, 2013.

### **Cox Response**

Cox understands and agrees, the circuits shall be available no later than 6/20/13 so that the customer can test and begin using for 7/1/2013

## SUPPORT and QUALIFICATIONS



Describe all of the implementation steps that will take place and provide timelines, stated in number of days, for each phase of the process.

### **Cox Response**

Cox Business has been installing and maintaining multi-site, 100 Mbp to 1 Gbps Ethernet based school board networks across South Louisiana for over a decade. As such, we bring to the table a team of highly skilled professionals, 8 metro e engineers, who will make any conversions as seamless as possible.

Cox will appoint one person from our Sales Operations department as the Project Manager (PM) for the installation. The PM will coordinate with the customer's Project Manager(s) and the different teams within Cox to plan and implement the project. Such teams include: Sales, Service Delivery, Fiber Design, Fiber Construction, Engineering, Field Services and Customer Care.

We will schedule a post-award meeting with leaders from the various teams and your personnel to allow the teams to get acquainted, discuss expectations, timelines, customer requirements, etc. This meeting will be followed by a kickoff meeting / conference call between Cox and St. Charles Parish Public Schools where follow up items from the post-award meeting are addressed and more concrete timelines and plans are discussed.

Following these meetings regular recurring email reports and conference calls between Cox and St. Charles Parish Public Schools will track the following:

- 1) Site surveys and contractor walk outs
- 2) Long haul and ring construction
- 3) Premise entry and construction
- 4) Coordination of school openings and closing
- 5) Special needs to be addressed on a per site basis
- 6) Equipment installation scheduling
- 7) Testing
- 8) Anything else that needs to be handled on a recurring or as-needed basis

## Prior Experience



Currently Cox Business Louisiana provides Internet/ WAN / and/or Voice access to the following agencies:

- *Vermilion Parish School Board*
  - *Ben Toupes 337-898-5847*
- *Recovery School District*
  - *Roderick "Devon" Matthews 504-312-0707*
- *Iberville Parish School System*
  - *Richard Ellis 225-776-1588*
- *St Martin Parish School Board*
  - *Christine Foster 337-332-2105 ext 3003*
- *East Baton Rouge Parish School Board*
  - *Darla Verrett 225-922-5526*
- *Jefferson Parish School Board*
  - *Vincente DiCarlo 504-349-8957*

State your experience in providing services which were E-rate funded in the telecommunications category in Louisiana.

### **Cox Response**

Cox Business has participated in the E-rate Program since 1998 and has provided services in Louisiana since 1996. Cox Business has participated in many major projects related to fiber optic based transport, Metro E and Internet services. Some of our current Metro E and/or Internet projects funded by E-rate include: The Recovery School District, St. Bernard Parish School Board, Algiers Charter Schools, Jefferson Parish Public Schools, St Martin Parish School Board, Iberville Parish School Board, East Baton Rouge Parish School Board and Vermillion Parish School Board.

# Client List



Name	Address	City	Service		
ALGIERS CHARTER SCHOOLS ASSOCIATION	3712 MACARTHUR DRIVE, SUITE 100A	NEW ORLEANS	WAN and Internet	Wilson Cole	504-304-1160
AUDUBON - CARROLLTON	719 S. CARROLLTON AVENUE	NEW ORLEANS	WAN and Internet	Dean Weber	504-359-8421
CABRINI HIGH SCHOOL	1400 MOSS ST	NEW ORLEANS	Internet	John Ford	504-482-1193
CRESCENT CITY SCHOOLS DISTRICT	2013 GENERAL MEYER AVENUE	NEW ORLEANS	Internet	Blake DiMarco	
DR. MARTIN LUTHER KING CHARTER SCHOOL	1617 CAFFIN AVENUE	NEW ORLEANS	WAN and Internet	Rick Silewicz	225-388-6792
E. P. HARNEY SPIRIT OF EXCELLENCE ACADEMY	2503 WILLOW STREET	NEW ORLEANS	Internet	Ms. Thompson	504-450-0188
EAST BATON ROUGE PARISH DIST	1030 S FOSTER DR	BATON ROUGE	WAN and Internet	Darla Verrett	225-922-3326
ENCORE ACADEMY	3205 CARONDELET ST, BLDG 201	NEW ORLEANS	Internet	Joseph Neary	225-436-9706
FANNIE C. WILLIAMS CHARTER SCHOOL	11733 DWYER ROAD	NEW ORLEANS	Internet	Kelly Beliste	504-373-6228
FIRSTLINE SCHOOLS	3649 LAUREL	NEW ORLEANS	WAN and Internet	Aron Michalski	504-717-3401
HOLY CROSS SCHOOL	5500 PARIS AVE	NEW ORLEANS	Internet	Jerry Amone	504-942-1831
IBERVILLE PARISH SCHOOL DIST	38030 PLAQUEMINE ST	PLAQUEMINE	WAN and Internet	Richard Ellis	225-687-4341
INTERNATIONAL HIGH	727 CARONDELET STREET	NEW ORLEANS	Internet	Tony Amato	<a href="#">AnthonyAmato</a>
INTERNATIONAL SCHOOL OF LOUISIANA	1400 CAMP STREET	NEW ORLEANS	WAN and Internet	David Powell	504-634-1088
JAMES M. SINGLETON CHARTER SCHOOL	2220 ORETHA CASTLE HALEY	NEW ORLEAN	Internet	Josh Williams	504-368-3299
JEFFERSON PARISH SCHOOL DIST	4600 RIVER ROAD	MARRERO	WAN and Internet	Vincent DiCarlo	504-349-8957
KIPP NEW ORLEANS SCHOOLS	3820 ST. CLAUDE AVENUE	NEW ORLEANS	WAN and Internet	Glenn Walker	504-363-6143
LAFAYETTE ACADEMY CHARTER SCHOOL DISTRICT	2727 S. CARROLLTON AVE	NEW ORLEANS	WAN and Internet	Tina Day	504-373-6280
LAFAYETTE PARISH LIBRARY	301 W CONGRESS ST	LAFAYETTE	WAN	Danny Gillane	337-261-5781
LOUISIANNA RESOURCE CENTER FOR EDUCATORS 2	3550 FLORIDA BOULEVARD	BATON ROUGE	Internet	Nancy Roberts	225-924-7600
LYCEE FRANCAIS DE LA NOUVELLE-ORLEANS	5401 S CLAIBORNE AVE	NEW ORLEANS	Internet	Dr Jean Montes	504-616-1632
MILLER MCCOY ACADEMY FOR					
MATHEMATICS & BUSINESS	7301 DWYER RD.	NEW ORLEANS	Internet	Ronnie King	504-920-6499
MORRIS JEFF COMMUNITY SCHOOL	2239 POYDRAS STREET	NEW ORLEANS	Internet	Jared Frank	504-717-1940
NEW BEGINNINGS SCHOOLS FOUNDATION	2043 LAKESHORE DRIVE, SUITE 413	NEW ORLEANS	WAN and Internet	Gilbert Bennett	504-280-2319
NEW ORLEANS CENTER FOR CREATIVE ARTS	2800 CHARTRES STREET	NEW ORLEANS	Internet	Richard Ramos	504-940-2787
NEW ORLEANS CHARTER SCHOOL FOUNDATION DBA MCDONOGH CITY PARK ACADEMY	2733 ESPLANDE AVE.	NEW ORLEANS	Internet	Keesanya Dupree	504-940-1740
NEW ORLEANS COLLEGE PREP-SYLVANIE					
WILLIAMS CAMPUS	3127 MARTIN LUTHER KING BLVD.	NEW ORLEANS	WAN and Internet	Kristen Lozada	504-388-2422
RECOVERY SCHOOL DISTRICT	1641 POLAND AVENUE	NEW ORLEANS and Baton Rouge	Internet	Roderick Matthe	404-775-5788
RENEW SCHOOL DISTRICT	3128 CONSTANCE STREET	NEW ORLEANS	WAN and Internet	Sean Hudson	504-941-1185
SLAUGHTER COMMUNITY CHARTER SCH	430 LAUREL ST SUITE 1703	BANTON	Internet	Merci Durham	225-436-0536
SOPHIE B. WRIGHT CHARTER SCHOOL	1426 NAPOLEON AVE	NEW ORLEANS	Internet	Calvin Tate	504-304-3915
ST BERNARD PARISH SCHOOL DIST	200 EAST ST. BERNARD HWY	CHALMETTE	WAN and Internet	George Candier	504-301-2000
SUCCESS PREPATORY ACADEMY	2011 BIENVILLE ST	NEW ORLEANS	Internet	Kat Coneybear	504-909-6273
THE CAREER ACADEMY	4373 E. BROOKSTOWN DRIVE	BATON ROUGE	Internet	Nancy Roberts	225-924-7600
VERMILION PARISH SCHOOL DIST	220 S JEFFERSON ST	ABBEVILLE	WAN and Internet	Ben Toups	337-896-3847
ZACHARY COMMUNITY SCHOOL DISTRICT	3735 CHURCH STREET	ZACHARY	Internet	Joe Rush	225-937-1467

## Cox Business Sales Contact List

Name	Title	Contact Information
<i>Vincente Borerros</i>	Account Executive Government and Education	(504) 358-6768 (ofc) (504) 401-2426 (cell)
<i>Loyd Daniels</i>	Sales Manager Vertical markets	(225)237-5258 (ofc) (225)678-8636 cell
<i>Bradley Pipes</i>	Sales Director	(504) 358-6065 (ofc) (540) 417-3887(cell)

## Technical Support and Escalation List

**To Report a Trouble:** Call 866-396-3947. Please provide the Customer Account Number, location address, and/or telephone number. You will also be asked for your Technical Contact Information and a description of the problem.

After reporting the trouble, you should expect a status update within 30 minutes. If you have not received an update, please follow the escalation path listed below.

**\*\*Note: It is very important that you report the trouble by calling the Technical Support Team first. This will allow the ticket to flow properly and will assist with tracking.**

### **Level 1 Escalation (\*\*Provide Ticket Number when Escalating\*\*)**

Lead Technical Representative      Call 866-396-3947 and ask for the Lead  
Technical Representative on duty

# Support



## **Level 2 Escalation**

Commercial Technical Support  
Supervisor

Jimmy Bianchini  
504-304-1773 Office  
504-401-2826 Mobile

---

## **Level 3 Escalation**

Manager

Shane Sedotal  
Manager, Customer Care  
225-237-5298 Office  
225-317-1369 Mobile

Ray Bell  
Manager, Operations  
225-237-5274 Office  
225-317-1640 Mobile

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## **Level 4 Escalation**

Director

Jude Marino  
Director, Sales Operations  
225-237-5329 Office  
225-317-2697 Mobile

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## **Level 5 Escalation**

Vice President, Cox Business

Leigh King  
225-237-5261 Office  
225-317-4001 Mobile

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Cox Business has local administrative and technical personnel to serve St. Charles Parish Public Schools. Once a technical problem is reported and a ticket number is issued a tech will be dispatched within two hours. Cox Business employees 1600 people across Southern Louisiana. Cox Business' Service Level Agreement (SLA) for customers served via fiber optics is (2) two hours from the time a trouble ticket is logged.



# Additional Pricing



Below is the proposed pricing for the St Charles Parish School Board. The Contract term is for 36 months.

Service Location	Service	Quantity	Monthly Charge	Installation	
<b>Metro E</b>					
All Locations	100 Mbps Metro E	1	\$600	\$0	
All Locations	250 Mbps Metro E	1	\$950	\$0	
All Locations	500 Mbps Metro E	1	\$1,100	\$0	
All Locations	1 Gbps Metro E	1	\$1,250	\$0	
All Locations	2 Gbps Metro E	1	\$4,300	\$0	
All Locations	3 Gbps Metro E	1	\$6,150	\$0	
All Locations	4 Gbps Metro E	1	\$8,000	\$0	
All Locations	5 Gbps Metro E	1	\$9,750	\$0	
All Locations	6 Gbps Metro E	1	\$11,400	\$0	
All Locations	7 Gbps Metro E	1	\$12,950	\$0	
All Locations	8 Gbps Metro E	1	\$14,400	\$0	
All Locations	9 Gbps Metro E	1	\$15,750	\$0	
All Locations	10 Gbps Metro E	1	\$17,000	\$0	
<b>Internet</b>					
Central Office	250 Mbps	1	\$3477.60	\$0	
Central Office	300 Mbps	1	\$4914	\$0	
Central Office	500 Mbps	1	\$6048	\$0	
Central Office	700 Mbps	1	\$9237	\$0	
Central Office	1000 Mbps	1	\$8190	\$0	
Central Office	1200 Mbps	1	\$13,377	\$0	
Central Office	1500 Mbps	1	\$16,380	\$0	
Central Office	2000 Mbps	1	\$21,158	\$0	
Central Office	3000 Mbps	1	\$29,689	\$0	
Central Office	5000 Mbps	1	\$42,656	\$0	
Central Office	10,000 Mbps	1	\$56,875	\$0	
<b>Voice Service</b>					
All Locations	Cox Voice Manager Basic		\$27.00 Each	\$0	
<b>Long Distance</b>					
All Locations	Domestic Long Distance	Per minute	.05	\$0	

These prices do not include taxes and government fees

## Attachments



- 1- St Charles Parish Price Pages
- 2- CLEC Certificate
- 3- Certificate of Insurance
- 4- Metro E SLA
- 5- Cox Optical Internet SLA
- 6- ALU 7210 Data Sheet
- 7- Network Diagram

## Dedicated Internet Access (DIA) Cost Sheet

St. Charles Parish Public Schools

13855 River Road

Luling, LA 70070

\* All pricing should reflect St. Charles Parish Public Schools providing and maintaining their own router.

Quantity	Connection Speed	Monthly Cost	Installation Fee
1	250 Mbps	\$3477.60	\$0.00
1	500 Mbps	\$6048.00	\$0.00
1	1000 Mbps (1Gbps)	\$8,190.00	\$0.00

List any additional costs here. Be sure to include all charges for deployment to the central office location, and all ongoing support costs. Costs must be eligible for E-rate in the telecommunications category.

  
Signature of Authorized Representative

1/14/2013

Date

Jacqueline D. Vines  
(Print Name)

## Wide Area Network (WAN) Cost Sheet

Vendor: Cox Louisiana Telcom, LLC. DBA Cox Business

Location	Circuit Quantity	Option 1 Monthly Recurring Cost  Bandwidth 100 Mbps	Option 2 Monthly Recurring Cost  Bandwidth 250 Mbps	Option 3 Monthly Recurring Cost  Bandwidth 500 Mbps Burstable to 1 Gbps	Option 3 Monthly Recurring Cost  Bandwidth 1 Gbp	Installation Cost  (To Point of Existing Circuit)
School Board Office 13855 River Road Luling, LA 70070	1	\$600	\$950	\$1100*	\$1250	
* Provide connectivity to/from Hahnville High School						
School Board Office 13855 River Road Luling, LA 70070	1	\$600	\$950	\$1100 *	\$1250	
* Provide connectivity to/from Destrehan High School						
School Board Office 13855 River Road Luling, LA 70070	1	\$600	\$950	\$1100*	\$1250	
* Provide connectivity to/from R. K. Smith Middle School						
School Board Office 13855 River Road Luling, LA 70070	1	\$600	\$950	\$1100*	\$1250	
* Provide connectivity to/from all remaining sites						
Destrehan High School #1 Wildcat Lane Destrehan, LA 70047	1	\$600	\$950	\$1100 *	\$1250	
Ethel B. Schoeffner Elementary 140 Plantation Road Destrehan, LA 70047	1	\$600	\$950	\$1100 *	\$1250	
Harry M. Hurst Middle 170 Road Runner Lane Destrehan, LA 70047	1	\$600	\$950	\$1100 *	\$1250	
Norco Elementary 102 Fifth Street Norco, LA 70079	1	\$600	\$950	\$1100*	\$1250	

Location	Circuit Quantity	Option 1 Monthly Recurring Cost	Option 2 Monthly Recurring Cost	Option 3 Monthly Recurring Cost	Option 3 Monthly Recurring Cost	Installation Cost  (To Point of Existing Circuit)
		Bandwidth 100 Mbps	Bandwidth 250 Mbps	Bandwidth 500 Mbps Burstable to 1 Gbps	Bandwidth 1 Gbp	
St. Rose Elementary 230 Pirate Drive St. Rose, LA 70087	1	\$600	\$950	\$1100*	\$1250	
Albert Cammon Middle 234 Pirate Drive St. Rose, LA 70087	1	\$600	\$950	\$1100*	\$1250	
G.W. Carver Elementary 337 Gum Street Hahnville, LA 70057	1	\$600	\$950	\$1100*	\$1250	
Eual J. Landry 108 Tiger Circle Hahnville, LA 70057	1	\$600	\$950	\$1100*	\$1250	
Mimosa Park Elementary 222 Birch Street Luling, LA 70070	1	\$600	\$950	\$1100*	\$1250	
Lakewood Elementary 501 East Heather Drive Luling, LA 70070	1	\$600	\$950	\$1100*	\$1250	
Media Center 209 1st Street Luling, LA 70070	1	\$600	\$950	\$1100*	\$1250	
Luling Elementary 904 Sugarhouse Road Luling, LA 70070	1	\$600	\$950	\$1100*	\$1250	
J. B. Martin Middle 434 South Street Paradis, LA 70080	1	\$600	\$950	\$1100*	\$1250	
R. J. Vial Elementary 510 Louisiana Street Paradis, LA 70080	1	\$600	\$950	\$1100*	\$1250	
Hahnville High School 200 Tiger Drive Boutte, LA 70039	1	\$600	\$950	\$1100*	\$1250	
Allemands Elementary 1471 WPA Road Des Allemands, LA 70030	1	\$600	\$950	\$1100*	\$1250	



Location	Circuit Quantity	Option 1 Monthly Recurring Cost	Option 2 Monthly Recurring Cost	Option 3 Monthly Recurring Cost	Option 3 Monthly Recurring Cost	Installation Cost  (To Point of Existing Circuit)
		Bandwidth 100 Mbps	Bandwidth 250 Mbps	Bandwidth 500 Mbps Burstable to 1 Gbps	Bandwidth 1 Gbp	
R. K. Smith Middle School 281 Judge Edward Dufresne Pkwy Luling, LA 70070	1	\$600	\$950	\$1100*	\$1250	
Technology Installation Center 12727 Hwy 90 Luling, LA 70070	1	\$600	\$950	\$1100*	\$1250	
Boutte Adult Learning Center 13771 Old Spanish Trail Boutte, LA 70039	1	\$600	\$950	\$1100*	\$1250	
Norco Adult Learning Center 149 Apple Street Norco, LA 70079	1	\$600	\$950	\$1100*	\$1250	
Maintenance Building 215 Judge Edward Dufresne Pkwy Luling, LA 70070	1	\$600	\$950	\$1100*	\$1250	

List any additional costs here. Be sure to include all charges for deployment to the location of the existing circuits, and all ongoing network support. Costs must be eligible for E-rate in the telecommunications category.

\* Bursting is not available. This price is for a fixed 500mbps.

Cox also has offered additional speeds that are available in the proposal.

  
Signature of Authorized Representative

Jacqueline D. Vines  
( Print Name)

1/14/2013

Date



# *Louisiana Public Service Commission*

## *Certificate of Authority to Operate*

Certificate Number TSP00137-B

*A Certificate of Authority to Operate is hereby granted to*

COX LOUISIANA TELCOM, L.L.C.  
D/B/A COX COMMUNICATIONS

(Reissued pursuant to name change from  
Cox Louisiana Telcom II, L.L.C.)


*A telecommunications service provider under the laws of Louisiana, whose principle office location or place of business is 1400 Lake Hearn Drive, Atlanta, Georgia 30319.*

*Cox Louisiana Telcom, L.L.C. d/b/a Cox Communications shall operate in full accordance with the rules and regulations of the Louisiana Public Service Commission relevant to the provision of telecommunications services. A letter of non-opposition was issued on December 18, 1998 approving the name change and corporate structure. The application as filed provides for Competitive Local Exchange Carrier Telecommunications Services and Resold Interexchange Telecommunications Services to include operator services within Louisiana.*

*Witness the signature and seal of the Commission at Baton Rouge, Louisiana this 25th day of February, 2000.*

Louisiana Public Service Commission

Attest:



Lawrence C. St. Blanc

Secretary





# CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)  
12/20/2011

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

**IMPORTANT:** If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

<b>PRODUCER</b> 1-678-393-5200 Arthur J. Gallagher Risk Management Services, Inc.  1117 Perimeter Center West Suite W201 Atlanta, GA 30338 Linda Smith		<b>CONTACT NAME:</b> Linda Smith <b>PHONE (A/C, No. Ext):</b> 678-393-5228 <b>FAX (A/C, No):</b> 678-393-5240 <b>E-MAIL ADDRESS:</b> linda_smith@ajg.com																						
<b>INSURED</b> Cox Communications, Inc. Cox Communications Louisiana PO Box 105357  Atlanta, GA 30348		<table border="1"><thead><tr><th colspan="2">INSURER(S) AFFORDING COVERAGE</th><th>NAIC #</th></tr></thead><tbody><tr><td>INSURER A:</td><td>NATIONAL UNION FIRE INS CO OF PITTS</td><td>19445</td></tr><tr><td>INSURER B:</td><td>NEW HAMPSHIRE INS CO</td><td>23841</td></tr><tr><td>INSURER C:</td><td>Illinois Natl Ins Co</td><td>23817</td></tr><tr><td>INSURER D:</td><td>New Hampshire Ins Co</td><td>23841</td></tr><tr><td>INSURER E:</td><td>ILLINOIS NATL INS CO</td><td>23817</td></tr><tr><td>INSURER F:</td><td></td><td></td></tr></tbody></table>		INSURER(S) AFFORDING COVERAGE		NAIC #	INSURER A:	NATIONAL UNION FIRE INS CO OF PITTS	19445	INSURER B:	NEW HAMPSHIRE INS CO	23841	INSURER C:	Illinois Natl Ins Co	23817	INSURER D:	New Hampshire Ins Co	23841	INSURER E:	ILLINOIS NATL INS CO	23817	INSURER F:		
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INSURER E:	ILLINOIS NATL INS CO	23817																						
INSURER F:																								

**COVERAGES****CERTIFICATE NUMBER:** 24538416**REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	<b>GENERAL LIABILITY</b> <input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR <input checked="" type="checkbox"/> EXCESS OF \$500,000 <input checked="" type="checkbox"/> SELF INSURED RETENTION GEN'L AGGREGATE LIMIT APPLIES PER: <input checked="" type="checkbox"/> POLICY <input type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC			GL2705017	01/01/12	01/01/13	EACH OCCURRENCE \$ 1,500,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 1,500,000 MED EXP (Any one person) \$ EXCLUDED PERSONAL & ADV INJURY \$ 1,500,000 GENERAL AGGREGATE \$ 30,000,000 PRODUCTS - COMP/OP AGG \$ 3,000,000 \$
A B A	<b>AUTOMOBILE LIABILITY</b> <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> ALL OWNED AUTOS <input checked="" type="checkbox"/> HIRED AUTOS <input type="checkbox"/> SCHEDULED AUTOS <input checked="" type="checkbox"/> NON-OWNED AUTOS			CA4309699(AOS) CA4309700(MA) CA4309701(VA)	01/01/12 01/01/12 01/01/12	01/01/13 01/01/13 01/01/13	COMBINED SINGLE LIMIT (Ea accident) \$ 2,000,000 BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$ \$
	<b>UMBRELLA LIAB</b> <input type="checkbox"/> EXCESS LIAB DED <input type="checkbox"/> RETENTION \$						EACH OCCURRENCE \$ AGGREGATE \$ \$
C D A A	<b>WORKERS COMPENSATION AND EMPLOYERS' LIABILITY</b> ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	Y/N <input type="checkbox"/>	N/A	WC015884410 (FL) WC015884408 (AOS) WC015884409 (CA) WC015884411 (OR)	01/01/12 01/01/12 01/01/12 01/01/12	01/01/13 01/01/13 01/01/13 01/01/13	<input checked="" type="checkbox"/> WC STATUTORY LIMITS <input type="checkbox"/> OTH-ER E.L. EACH ACCIDENT \$ 1,000,000 E.L. DISEASE - EA EMPLOYEE \$ 1,000,000 E.L. DISEASE - POLICY LIMIT \$ 1,000,000
E	<b>WORK COMP/EMPLOYERS LIAB</b>			WC061967593(MA/ND/WA/WI/WY)	01/01/12	01/01/13	SEE ABOVE AMT OF INSURANCE

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)  
FOR INFORMATION PURPOSES ONLY

**CERTIFICATE HOLDER****CANCELLATION**

For Information Purposes Only

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

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ACORD 25 (2010/05)

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lsmith

24538416



## Cox Ethernet Services Metro Ethernet - Fiber Service Level Agreement

**I. Scope.** This Service Level Agreement (“SLA”) is incorporated into the Commercial Services Agreement (“Agreement”) by and between Cox Business (“Cox”) and the Customer. Cox shall endeavor to meet the performance standards and service levels set forth in this SLA with respect to the Cox Ethernet Services (“Services”) provided to the undersigned Customer.

**A. Ethernet Frame Delay.** Ethernet Frame Delay (latency), as it relates to the Services, is defined by Cox as the time elapsed from when the first bit of an Ethernet Service Frame (ESF) enters the ingress User Network Interface (UNI) to when the last bit of the same frame leaves the egress UNI. Ethernet Frame Delay shall be 10 milliseconds or less, averaged on a monthly basis. Ethernet Frame Delay performance objective is applicable to ESFs that traverse a single Cox Metro Ethernet Network and are designated as “Real Time Class of Service” traffic per the Cox Metro Ethernet Service specifications. The ESFs must also be “in-profile” (conform to the performance attributes of the Services) at both the ingress and egress UNIs of any given Ethernet Virtual Connection (EVC).

**B. Ethernet Frame Loss Ratio.** Ethernet Frame Loss Ratio (loss), as it relates to the Services, is defined by Cox as the percentage of Ethernet Service Frames that arrive at an ingress UNI and should be delivered to an egress UNI. Ethernet Frame Loss Ratio shall be no more than 0.1%, averaged on a monthly basis. Ethernet Frame Loss Ratio performance objective is applicable to ESFs that traverse a single Cox Metro Ethernet Network and are designated as “Real Time Class of Service” traffic per the Cox Metro Ethernet Service specifications. The ESFs must also be “in-profile” (conform to the performance attributes of the Services) at both the ingress and egress UNIs of any given EVC.

**C. Ethernet Frame Delay Variation.** Ethernet Frame Delay Variation (jitter), as it relates to the Services, is defined by Cox as the variation in the delay between a pair of consecutive Ethernet Service Frames. Ethernet Frame Delay Variation shall be 1 milliseconds or less, averaged on a monthly basis. Ethernet Frame Delay Variation performance objective is applicable to ESFs that traverse a single Cox Metro Ethernet Network and are designated as “Real Time Class of Service” traffic per the Cox Metro Ethernet Service specifications. The ESFs must also be “in-profile” (conform to the performance attributes of the Services) at both the ingress and egress UNIs of any given EVC.

**D. Service Availability.** The Services are delivered via an Ethernet User Network Interface (“Port”) and associated Ethernet Virtual Connection(s). Service Availability is defined by Cox as the ability to send or receive Ethernet Service Frames at a given Port via an associated EVC(s). A Port and associated

EVC(s) shall be available for use by Customer with the Services provided under the Agreement at least 99.9% of the available time (“Service Availability”). This parameter is calculated by dividing the number of minutes a Port and associated EVC(s) is available for Customer’s use by the total number of minutes in any consecutive thirty (30) day period and multiplying by 100. In calculating Service Availability, the reasons or causes set forth in Section IV of this SLA shall not be included in determining whether Cox has met the applicable performance standard for Service Availability. For example, if a Port and associated EVC(s) experiences an outage for One (1) day due to a Force Majeure (flood) event, and otherwise experiences no other outage or Service Interruption during the applicable month, Cox will be deemed to have met the Service Availability performance standard.

**1. Service Interruption.** A Service Interruption or an outage in Services is not a Default under the Agreement, but may entitle Customer to credits as provided in this SLA. A Service Interruption is an interruption of a Port (“Affected Port”) or failure of an associated EVC(s) (“Affected EVC”) that results in the total disruption of the Services delivered over the Affected Port and Affected EVC (“Outage”). A Service Interruption period begins when Customer makes a Trouble Report (as defined below) to Cox’s Network Operations Center (NOC) under the methods and procedures set forth in Section II of this SLA and ends when Cox restores the Services to Customer.

**2. Service Interruption Credits for Service Availability.** A Credit Allowance will be applicable in any month during the term of the Agreement when there is a Service Interruption that qualifies for a credit allowance. The Credit Allowance shall be the applicable credit, identified in the table below, of the monthly recurring charges (“MRC”) associated with the Affected Port and EVCs. The Credit Allowance will not include credits for any Ports or associated EVC(s) determined to be in good working order. The amount of the Credit Allowance shall be as follows:

### Cox Ethernet Services - Standard

Metro Ethernet – Fiber	
<i>Services Interruption Length</i>	<i>Credit</i>
< 1 hour, continuous	None
> 1 hour, continuous	1/30 of monthly charges due for the applicable month for each 4 hours or portion thereof that the service interruption occurs

**3. Major Outage.** If two (2) times during a thirty (30) consecutive day period, a Port or associated EVC(s) experiences a Service Interruption for a period greater than twelve (12)



consecutive hours, ("Major Outage") other than as a result of the causes set forth in Section IV below, Customer may terminate the Affected Port and Affected EVC(s) without charge or payment of any termination charges otherwise provided in the Agreement; provided Customer complies with the notification process described in this Section 3. Within thirty (30) days of the occurrence of the 2<sup>nd</sup> Major Outage, Customer shall notify Cox in writing of its election to terminate the Affected Port and Affected EVC(s) and the Affected Port/Affected EVC(s) shall terminate upon Cox's receipt of such notice. If Customer fails to notify Cox within thirty (30) days of the 2<sup>nd</sup> Major Outage, of its intent to terminate, then Customer shall be deemed to have waived its right to terminate the Affected Port and Affected EVC(s) under this Section 3 until the occurrence of a subsequent Major Outage, if any. Upon termination under this Section 3, neither party shall have any further rights, obligations, or liabilities to the other party, except those accrued through the termination date, and that expressly survive termination of this Agreement.

**II. Trouble Reports.** Cox shall maintain a twenty-four (24) hour, seven (7) day a week point-of-contact for Customers to report Service troubles, outages or Service Interruptions. Customer shall call Trouble Reports to **866.291.2262**. A "Trouble Report" means any report made by Customer relating to the Services or the equipment provided by Cox. In the event Cox receives a Trouble Report from Customer, Cox shall respond to the Trouble Report within the following time frames as described below:

**A. Service Response and Resolution.** In the event Cox receives a Trouble Report from Customer, Cox will initiate action to clear the trouble within 30 minutes. If the Trouble Report is the result of an electronic component failure, the maximum restoration time is 4 hours. If the Trouble Report is the result of a fiber optic cable failure, the maximum restoration time is 8 hours.

**1. Trouble Report Service Level.** Cox will endeavor to achieve at least 95% Trouble Reports Cured Timely. This parameter is calculated by dividing the total number of Trouble Reports from Customer that are cured by Cox within the windows set forth above by the total number of Trouble Reports received by Cox from Customer in any twelve (12) consecutive month period and multiplying by 100. In calculating Trouble Reports Cured Timely, the reasons or causes set forth in Section IV of this SLA shall not be included in determining whether Cox has met the applicable performance standard for Trouble Reports Cured Timely. For example, if the Services experience an outage due to an electronic component failure, and Cox was not allowed access to the premises of Customer to access Cox equipment, Cox will be deemed to have met the Trouble Report Cured Timely performance standard.

### **III. Service Installation Intervals.**

**A. Service Installation and Availability.** Cox shall endeavor to install, provision and make the Services available for Customer's use within ten (10) business days of the

Committed Service Date as communicated to Customer by Cox. Service availability shall mean that Cox has completed its obligations to install the Cox equipment and facilities set forth in the Agreement necessary to provide Customer the Services.

**1. Installation Credit.** Cox shall provide Customer with an Installation Delay Credit if the Services are not available for Customer's use within ten (10) business days of the Committed Service Date. In this event, Customer will be entitled to an Installation Delay Credit of an amount equal to the nonrecurring charge (NRC) of that portion of the Service which was unavailable. This installation credit shall apply only to Cox standard NRCs and shall not apply to construction charges billed to Customer that are associated with providing Service to Customer.

**2. Exceptions to Installation Delay Credits.** Installation Delay Credits shall not be provided for Installation Delays (i) caused by or requested by Customer, its employees, agents or subcontractors; (ii) due to inability of Cox to access Customer's premises due to restrictions by Customer's landlord or property owner; (iii) due to the public utility company restricting Cox's access to necessary conduits or wiring in Customer's building or property; or (iv) due to Force Majeure events.

**IV. Exceptions to Credit Allowance.** Credit Allowances shall not be provided for any failures to meet the SLAs specified herein: (i) caused by Customer, its employees, agents or subcontractors; (ii) due to failure of power or other equipment provided by Customer or the public utility company supplying power to Cox or Customer; (iii) during any period in which Cox is not allowed access to the premises of Customer to access Cox equipment; (iv) due to scheduled maintenance and repair; (v) caused by or due to violations of the Cox Acceptable Use Policy (Internet data customers); (vi) caused by a loss of service or failure of the Customer's internal wiring or other customer equipment; or (vii) due to Force Majeure events. For purposes of this SLA, Force Majeure shall mean (i) third party cable cuts, acts of God, fire, flood, or other natural disaster; (ii) laws, orders, rules, regulations, directions, or actions of governmental authorities having jurisdiction over the Services; (iii) any civil or military action including national emergencies, riots, war, civil insurrections or terrorist attacks; (iv) taking by condemnation or eminent domain of a party's facilities or equipment; or (v) delays in obtaining permit or other approvals from governmental authorities for construction or Services provisioning.

**V. Limitations.** With respect to all credits under this SLA, no credits shall be issued if: (i) Customer is in breach of its Agreement with Cox; (ii) Customer has a past due balance with Cox under the Agreement; or (iii) Customer is otherwise not in good financial standing with Cox. In addition, in any calendar month, customer's combined credits will be no more than One (1) full Monthly Recurring Charge (MRC). All claims for credit allowances must be initiated by the customer and are subject to review and verification by Cox. Cox reserves the right to change or modify the program rules and regulations or discontinue this SLA at any time without notice.



## **Cox Optical Internet Service Level Agreement (SLA)**

This Service Level Agreement ("SLA") outlines the minimum service that a Customer may expect from CoxCom, Inc. ("Cox") for Cox Optical Internet Services from Cox. This SLA is applicable only for Cox commercial Customers that execute a Commercial Services Agreement ("Agreement") and this SLA is incorporated into the Agreement. This SLA applies only to Cox Optical Internet ("COI") service purchased as a bundled product with IP addressing, and is not applicable to Cox Business Internet cable modem service, private line services, telephone services, video services, or any other Cox service purchased under other agreements with Cox or its affiliates. The credit allowances and the rights provided in this SLA and the Agreement are Customer's sole and exclusive remedies for failure of Cox to comply with the Service Levels provided in this SLA. If Customer and Cox have negotiated an SLA on an individual case basis (ICB SLA) and such SLA is incorporated into the Agreement, the ICB SLA shall control the rights and obligations rather than this Optical SLA.

### **Network Latency Service Level**

Network Latency is defined by Cox as the round-trip delay for a packet to travel between two Regional Data Centers (RDCs) on the Cox IP backbone, averaged on a monthly basis. The average monthly round-trip delay is measured in milliseconds. Cox's Network Latency Service Level is **70** milliseconds or less. Network performance statistics and methodology related to the Cox Network Latency Service Level are posted at the following location: [http://www.coxbusiness.com/svpn/cbs\\_stats.htm](http://www.coxbusiness.com/svpn/cbs_stats.htm)

If Cox fails to meet any Network Latency Service Level in a calendar month, Customer's account shall be automatically credited as follows: The credit allowance shall consist of pro-rated charges for three (3) days of the Cox monthly recurring charge (MRC) for COI Service for the applicable month.

### **Network Packet Delivery Service Level**

Network Packet Loss is defined by Cox as the percentage of packets lost during a transmission between two Regional Data Center (RDCs) on the Cox IP backbone, averaged on a monthly basis. The average monthly packet loss is measure in percentage of packets dropped per 100. Cox's Network Packet Delivery Service Level is **99%** or greater. Network performance statistics and methodology related to the Cox Network Packet Delivery Service Level are posted at the following location: [http://www.coxbusiness.com/svpn/cbs\\_stats.htm](http://www.coxbusiness.com/svpn/cbs_stats.htm)

If Cox fails to meet any Network Packet Delivery Service Level in a calendar month, Customer's account shall be automatically credited as follows: The credit allowance shall consist of pro-rated charges for three (3) days of the Cox MRC for COI Service for the applicable month.

### **Network Availability Service Level**

Network Availability, as it relates to the COI Service, is defined by Cox as the ability to transmit data from the Cox demarc at the Customer location to any one of the transit or peering points on the Cox IP backbone. Network Availability does not mean the customer will be able to reach any site or user on the Internet, nor does it mean any site or user on the Internet can reach the Customer, as there are many factors, outside of Cox's control, that can affect an end-to-end connection. Cox's Network Availability Service Level is **100%** when customer's location is provisioned using Cox redundant-path local access circuits ("Enhanced Local Access"). For all other Cox-provided local access methods, Cox Network Availability Service Level is **99.9%** ("Standard Local Access"). The Network Availability Service Level parameter does not apply to the portion of the services or circuits obtained by Cox from third party





carriers that are commonly known as "Type II circuits" or service; provided, however, if Cox provisions for Customer a COI service or circuit which includes a Cox-provisioned Type II circuit, if Customer experiences a Network Outage in the Cox IP Backbone, the applicable Credit Allowance shall be calculated on the entire circuit, including the Type II portion.

If Cox experiences a Network Outage in excess of the Network Availability Service Level, Cox shall credit Customer's account as follows:

#### Enhanced Local Access

Network Outage Length (Per occurrence)	Credit Allowance
Up to one hour	One day (1/30 of MRC)
More than one hour	One day for each hour or portion thereof

#### Standard Local Access

Network Outage Length (per occurrence)	Credit Allowance
Up to one hour	None
More than one hour	One day for each hour or portion thereof.

### **Additional Agreement Termination Rights**

In addition to any termination rights as provided in the Agreement, Customer shall have the right to terminate the Agreement, upon prior written notice to Cox, if the Services purchased under the Agreement experiences five (5) or more Network Outages lasting four (4) hours or more each during any consecutive (60) day period.

### **Program Rules and Regulations**

#### 1. Definitions

**"Cox IP Backbone"** is defined as the Cox, owned and/or managed and operated Internet Protocol (IP) infrastructure identified as AS22773 and which includes certain Cox Internet Service Points of Presence (POPs) in the United States, the telecommunications equipment and facilities that interconnect all wiring within them, and the physical plant that surrounds them. The Cox IP backbone does not include CPE nor the dedicated access facility connecting the customer's premises to the Cox IP Backbone.

**"Enhanced Local Access"** is defined as a customer location served with dual-entrance facilities provisioned with redundant local routes over a Cox-ringed fiber architecture.

**"Standard Local Access"** is defined as a customer location served with single-entrance facilities provisioned over a local Cox fiber infrastructure.

**"Network Outage"** is defined as an occurrence within the Cox IP backbone and the local dedicated access facility provided by Cox that results in the inability of the Cox backbone to transmit IP packets on behalf of the customer. Network Outages related to customer provided CPE, Type II circuits, or





cabling/riser beyond the Cox demarcation point are not considered a "Network Outage". The duration of the "Network Outage" will be determined by summing the amount of time customer trouble tickets are open with the appropriate Cox Customer Care organization for COI in any given month. For purposes of calculating credit allowance due to Customer, the time starts with the opening of a trouble ticket by Cox Customer Care and ends when Cox Customer Care makes its first attempt to notify the Customer of the restoration of the Service.

2. Exceptions. Cox shall not provide credit allowances for failure to meet the Network Latency Service Level, Network Packet Delivery Service Level and/or the Network Availability Service Level under the following reasons or exceptions:
  - If Customer is in breach of its Agreement with Cox or Customer has a past due balance with Cox under the Agreement or is otherwise not in good financial standing with Cox.
  - Scheduled maintenance.
  - Customer fails to report an outage and open a trouble ticket within thirty (30) days of the outage.
  - Outage or error of any Cox measurement system (credits not granted because measurement system failed).
  - Acts or omissions by Customer, its employees, agents, contractors or authorized users which cause an outage, including without limitation, violation of the applicable Cox Optical Internet Acceptable Use Policies.
  - Outages in Type II Circuits whether provisioned and supplied by Cox or supplied or provisioned by Customer.
  - Customer shall not receive a credit allowance for any period in which Cox is not allowed access to the premises of Customer or End User to access Cox termination equipment if necessary to repair or evaluate the outage.
  - Force Majeure events. For purpose of this SLA, Force Majeure shall mean (i) causes beyond the reasonable control of Cox, including, but not limited to, third party cable cuts, acts of God, acts of terrorists, fire, flood, or other natural disaster; (ii) laws, orders, rules, regulations, directions, or actions of governmental authorities having jurisdiction over this Agreement; (iii) any civil or military action including national emergencies, riots, war, civil insurrections, or (iv) taking by condemnation or eminent domain of a party's facilities or equipment.
3. The Customer Point of Contact (CPOC) must notify Cox Customer Care immediately of a Network Outage via the applicable local Customer Care number. Cox Customer Care will investigate the reported outage and assign a trouble ticket number.
4. All credit requests associated with the Network Availability Service Level should be sent via an email addressed to your local Cox Customer Care representative. **Please include the trouble ticket number with your request.**
5. The Network Availability Service Level will take effect upon the Service Activation Date of the COI service.
6. The Latency and Packet Delivery Service Levels will take effect in the calendar month following customer's first use of the COI service.
7. The monthly connection charge that will be the subject of the credit allowance will be the MRC for the COI service, excluding any CPE or managed service charges.



8. In any calendar month, customer's combined credit allowances for the Network Latency Service Level and Network Packet Delivery Service Levels shall not exceed three (3) days (1/10 of the monthly charge).
9. In any calendar month, customer's combined credit allowances for the Network Latency Service Level, Network Packet Delivery Service Level and/or Network Availability Service Level will be no more than one full month's MRC.
10. Credit allowance shall not be given for Service Level failures due to Force Majeure events which are defined as (i) causes beyond the reasonable control of Cox, including, but not limited to, third party cable cuts, acts of God, fire, flood, or other natural disaster; (ii) laws, orders, rules, regulations, directions, or actions of governmental authorities having jurisdiction over this Agreement; (iii) any civil or military action including national emergencies, riots, war, civil insurrections, terrorist attacks; (iv) taking by condemnation or eminent domain of a party's facilities or equipment (v) strikes or labor disputes or (vi) power outages or fuel or energy shortages.
11. All claims for credit allowances are subject to review and verification by Cox.
12. Cox will determine in its sole discretion whether a customer experienced a Network Outage or whether Cox has failed to meet its Network Latency Service Level or Network Packet Delivery Service Level.
13. Cox reserves the right to change or modify the program rules and regulations or discontinue this SLA at any time without notice.
14. Credit allowances are exclusive of any applicable taxes charged to the customer or collected by Cox.

## Alcatel-Lucent 7210 SAS-M

SERVICE ACCESS SWITCH | RELEASE 1.1

Purpose-built to enable cost-effective and highly scalable MPLS-enabled Carrier Ethernet services delivery, the Alcatel-Lucent 7210 Service Access Switch (SAS)-M is a customer edge and aggregation device designed to address the metro and wide area network (WAN) business, mobile and residential service markets. The 7210 SAS-M extends MPLS capabilities and manageability into the customer edge for a new breed of highly available and fully managed MPLS-enabled Carrier Ethernet services, and extends the reach of the MPLS-enabled Carrier Ethernet aggregation network into smaller sites. The 7210 SAS-M provides 10GigE and GigE uplink options, leverages the powerful Alcatel-Lucent Service Router Operating System (SR OS), and is managed by the Alcatel-Lucent Service Aware Manager (SAM).



The Alcatel-Lucent 7210 Service Access Switch (SAS) is a family of next-generation, small footprint, Carrier Ethernet customer edge and aggregation devices. As a member of the industry-leading Carrier Ethernet product portfolio, the Alcatel-Lucent 7210 SAS-M allows service providers to cost-effectively scale existing fiber ring and mesh build outs toward 10GigE. The Alcatel-Lucent 7210 SAS-M provides a temperature-hardened variant for more severe deployment environments, optimizes the business case for providing innovative Ethernet services to multiple locations, and delivers multiple services per port.

Powered by the industry-leading SR OS, MPLS and 5620 Service Aware Manager (SAM), the Alcatel-Lucent 7210 SAS-M enables incumbent service providers, competitive carriers, multi-service operators (MSOs) and enterprise customers with the ability to innovate and differentiate their retail and wholesale Carrier Ethernet

Virtual Private Network (VPN) service portfolio by extending service level agreements (SLAs) into the customer edge. Stringent SLAs require end-to-end service delivery with differentiation based on reliability, quality of service (QoS), operation, administration and maintenance (OAM) tools and simplified management. To meet the reliability requirements of enhanced MPLS/Virtual Private LAN Service (VPLS)-based services for mission critical applications, the Alcatel-Lucent 7210 SAS-M supports fast reroute (FRR) and pseudowire redundancy over dual-homed connections into the customer edge for end-to-end, highly available service delivery. The 7210 SAS-M supports MPLS traffic engineering with resource reservation protocol — traffic engineering (RSVP-TE). When combined with the per-service attributes of the Alcatel-Lucent SR OS, service providers can enable services end-to-end across an IP/MPLS network with guaranteed QoS per application within a single SLA.

Per-service OAM ensures end-to-end operational consistency, rapid trouble-shooting and detailed performance measurement for further service differentiation. The Alcatel-Lucent 5620 SAM simplifies the end-to-end service management of Carrier Ethernet services by expediting initial time to market for service provisioning, as well as on-going moves, adds and changes as the service requirements evolve for the subscribers.

The Alcatel-Lucent 7210 SAS-M supports MPLS-based Carrier Ethernet VPN services. These services include spoke access to hierarchical VPLS (H-VPLS — also referred to as E-LAN by the MEF) multi-point services, Virtual Leased Line (VLL — also referred to as E-Line by the MEF) point-to-point services, along with Ethernet access to enhanced Internet services (IES) and IP VPN services.

With its flexibility to be deployed in 10GigE and GigE networking environments, a temperature hardened variant option to support extended temperature ranges (ETR) and MPLS across all ports, the 7210 SAS-M can be deployed as a cost-effective aggregation device for business VPN and residential services to extend the reach of the MPLS-enabled Carrier Ethernet aggregation network to smaller sites. In addition, with support for MPLS resiliency mechanisms, pseudowires and extended temperature ranges, the 7210 SAS-M can also be deployed at the cell site or used to backhaul 3G and LTE mobile services in Ethernet-centric mobile networks.

The Alcatel-Lucent 7210 SAS-M is Metro Ethernet Forum (MEF) 9 and MEF 14 certified and supports MPLS resiliency mechanisms with per-service QoS and OAM tools. The 7210 SAS-M is a wire-speed non-blocking platform, delivering 2 x 10GigE (XFP) and 24 x 100/1000 GigE (SFP) ports. It can also support 10/100/1000BASE-T copper and coarse wave division multiplexing (CWDM) SFPs for added configuration flexibility.

With support for dual-homed point-to-point and ring topologies, the 7210 SAS-M has the flexibility for use in single tenant and multi-tenant offices as well as campus environments.

For operational efficiency with streamlined management and effective service assurance, the Alcatel-Lucent 7210 SAS-M is fully managed by the 5620 SAM, giving the operator a comprehensive, easy-to-use fault management system, a full suite of OAM tests for SLA compliance, simplified service provisioning with GUI-based templates, and threshold crossing alerts to identify issues before they affect customers. Full integration with the Alcatel-Lucent 5650 Control Plane Assurance Manager (CPAM) enables users to proactively detect abnormal control plane behavior and to rapidly resolve problems by visualizing control plane topology and routing configuration. The OSS Connected Partner program offers certified integration with industry-leading OSS applications, including service assurance, provisioning and traffic engineering.

For enterprise and vertical market customers who install and manage their own private networks, the Alcatel-Lucent 7210 SAS-M increases the services they can provide to their internal customers while reducing operating costs. The 7210 SAS-M provides a number of benefits to Information and Communication Technology directors who manage such networks. They can leverage MPLS resiliency mechanisms to deliver highly available services while cost-effectively delivering advanced voice, video and data services. They can reduce network complexity and leased line costs through a single metro/WAN uplink and have the added flexibility to deploy the 7210 SAS-M in harsh operating environments that require extended temperature ranges. They can also provide easy service delivery with quick moves and changes to services, along with seamless integration with MPLS-enabled Carrier Ethernet aggregation and core IP/MPLS

networks from Alcatel-Lucent. With its lower power consumption, the 7210 SAS-M is designed to be environmentally friendly by helping operators meet their energy efficiency and environmental goals.

## Features

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- Wire-speed, non-blocking, service-aware MPLS switch
- Three platform options:
  - ↪ 7210 SAS-M24F2XFP: 2 x 10GigE (XFP) + 24 x 100/1000 optical SFP ports
  - ↪ 7210 SAS-M24F2XFP (ETR): 2 x 10GigE (XFP) + 24 x 100/1000 optical SFP ports (ETR)
  - ↪ 7210 SAS-M24F: 24 x 100/1000 optical SFP ports
- MPLS is available across all ports, and features include FRR, RSVP-TE and targeted label distribution protocol (T-LDP), primary and secondary label switched paths (LSPs), and pseudowire redundancy
- Support for 10GigE and GigE uplinks in ring or mesh topologies
- 7210 SAS-M (10GigE - ETR) variant supports extended temperature ranges from -40°C to +65°C (-40°F to +149°F)
- Powered by SR OS for feature-rich Carrier Ethernet VPN services
  - ↪ Per-service quality of service (QoS) with up to eight levels of class-based queuing per port
  - ↪ Per-service OAM supports extensive MPLS OAM toolkit along with IEEE 802.1ag, IEEE 802.3ah and local service mirroring
  - ↪ Service assurance agent (SAA) provides two-way measurements of jitter, latency and packet loss
- Dual-homed connections to separate Carrier Ethernet aggregation devices
- Ethernet features include IEEE 802.1Q, xSTP, LAG and mVPLS/RSTP
- MEF 9 and MEF 14 certified platform
- Support for a wide range of pluggable SFP optics, including 10/100/1000BASE-T copper and CWDM SFPs for greater flexibility

- Network Equipment Building System (NEBS) 3 compliant platform
  - Managed by the 5620 SAM and 5650 CPAM
  - Provides four opto-isolated inputs and two dry relay contact alarm outputs through a DB-15 interface on the front panel
  - Hot-swappable, redundant, load-sharing AC or DC power and hot-swappable fan modules
- Reduce the cost of customer acquisition with common OS and seamless service extension capabilities with 7450 ESS, 7705 SAR, 7750 SR, and 7710 SR solutions
  - Simplify enterprise networking complexity with stringent SLAs that support a full suite of demanding enterprise applications over a single Ethernet connection
  - Extend MPLS, SR OS and management to the customer edge to support enhanced VPLS (E-LAN), VLL (E-Line), and Ethernet access to IES and IP VPN services
  - Flexible deployment options to cost-effectively extend the reach of the MPLS-enabled Carrier Ethernet aggregation network into smaller sites or closer to the end user
  - Provide backhaul and aggregation of 3G and LTE mobile services into MPLS-enabled Carrier Ethernet networking environments
- Deliver operational efficiency with simplified management and service assurance that tightly integrates the 5620 SAM, 5650 CPAM and the extensive OAM toolkit for rapid troubleshooting and expediting initial time to market for service activation with quick moves, adds and changes for end-to-end managed service delivery
  - Effectively monitor and measure SLA performance into the customer edge
  - Provide a cost-effective MPLS demarcation device for retail or wholesale services, to single or multiple customers using flexible networking topologies

## Benefits

- Increase revenue with a full suite of enhanced MPLS-based Carrier Ethernet VPN services with differentiated, highly available services
- Scale bandwidth toward 10GigE without the cost of additional fiber build outs
- ETR variant enables deployment in more severe temperature environments

**Table 1. 7210 SAS platform hardware summary**

	7210 SAS-M [7210 SAS-M24F]	7210 SAS-M (10GigE) [7210 SAS-M24F2XFP]	7210 SAS-M (10GigE – ETR) [7210 SAS-M24F2XFP (ETR)]
MPLS	√	√	√
Hot-swappable power supplies	√	√	√
Hot-swappable fan tray	√	√	√
Expansion slot	√	√	√
Dry contacts (input and output)	√	√	√
GigE uplinks	√	√	√
10GigE uplinks	–	√	√
Extended temperature range	–	–	√

## Technical specifications

### Physical interfaces

- 24 × 100/1000 SFP optical ports
- 2 × 10GigE XFP optical ports available on selected variants (see Table 1)
- Support for a wide range of pluggable SFP optics, including 10/100/1000BASE-T copper SFPs and CWDM SFPs
- Four opto-isolated inputs (supported in a future release) and two dry relay contact outputs through a DB-15 interface on the front panel
- One expansion slot (for future use)

- One Ethernet out of band management port (supported in future release)
- One management console port

### Performance

- Full wire-speed switching
- Throughput (half-duplex): 48 Gb/s
- MAC address table size: 16 K
- Jumbo frame size: 9 kB

### MPLS

- RSVP-TE
- T-LDP
- FRR detour LSPs (one-to-one)
- PW redundancy on VLLs

- Primary and secondary LSPs
- Static LSPs

### Routing

- Static
- OSPF with TE extensions
- IS-IS with TE extensions

### Ethernet service delivery

- Layer 2 VLL and VPLS service delivery
  - MEF defined E-Line (Ethernet private line [EPL] and Ethernet Virtual Private Line [EVPL]) and E-LAN service delivery
  - MAC limiting (per service and per SAP)

- Ability to disable MAC learning
- Ability to add MAC statically
- Ability to discard unknown MAC
- MAC pinning
- Encapsulations:
  - null/dot1q on access ports
- Spanning Tree Protocol on access and uplinks
  - IEEE 802.1D Spanning Tree Protocol (STP)
  - IEEE 802.1w Rapid Spanning Tree Protocol (RSTP)
- Management VPLS with RSTP
- Tunneling Layer 2 control protocols (L2PT)

- Bridged Protocol Data Unit (BPDU) translation
- Port-based split horizon group (SHG)
- Internet Group Management-Protocol (IGMP) snooping
- IPv6 bridging

### Advanced Quality of Service

- MEF 9 and MEF 14 certified
- Packet classification based on Layer 2 criteria (MAC, Ethertype, IEEE 802.1p)
- Packet classification based on IP criteria DSCP
- Egress port rate limiting
- Egress re-marking
  - IEEE 802.1p on access and network ports
  - MPLS EXP on network ports
  - IP DSCP on network ports
- Traffic rate limiting/policing on service ingress and network ingress
  - SrTCM (single rate three color marker)
  - TrTCM (two rate three color marker)
  - Unknown unicast, broadcast and multicast packets can be rate-limited independently
- WRED (weighted random early detection)
- Eight traffic classes (forwarding classes)
- Eight queues per port
- Scheduling (RR, WDRR, WRR, Strict Priority, Hybrid)
- Access control lists
  - Layer 2 criteria (Ethertype, SRC/DST MAC, Layer 2 protocols, dot1p)
  - Layer 3 criteria (IP SRC/DST, DSCP)
  - Layer 4 – Layer 7 criteria (TCP/UDP port, for applications like FTP, Telnet)
- Statistics
  - Ingress, per meter (per SAP per FC) statistics bytes and packets
  - Egress per queue statistics per port
  - Ingress per meter (per IP interface per FC) statistics bytes and packets
  - Per SDP and pseudowire (VC) statistics
  - Collect and store billing statistics to accounting file

### High availability

- Dual-homing using STP or management VPLS (mVPLS)
- FRR detour LSPs (one-to-one)
- Primary and secondary LSPs
- PW redundancy for VLL
- IEEE 802.3ad LAG on network ports

- IEEE 802.3ad LAG on access ports
- Modular SR OS
- Hot-swappable, redundant, load-sharing AC or DC power
- Hot-swappable fan module containing three fans; device continues operation if one fails (raising simultaneous alarm)

### OAM

- MPLS OAM toolkit
- IEEE 802.3ah EFM OAM including dying gasp on network ports
- IEEE 802.1ag CFM OAM (support down maintenance entry points [MEPs]/maintenance intermediate points [MIPs])
- Hardware-ready to support ITU-T Y.1731
- Service assurance agent (SAA):
  - Two-way measurements
  - Software-based time stamps
  - Threshold monitors send alerts based on SAA measurements to operator if SLA performance statistics deviate from set parameters
- Service mirroring:
  - Local mirroring
  - Port mirroring (ingress and egress)
  - Support the following ingress mirror sources:
    - SAP
    - Filter
  - Mirror destination
    - Null SAP
- ICMPv4 (ping and traceroute)
- Accounting policy support
- Event and logging support as in SR OS
- Time-of-day support for implementing policies
- Cron jobs as in SR OS
- Remote upgrade of SR OS software

### Network management

- Alcatel-Lucent 5620 Service Aware Manager (SAM)
  - Fault management, root cause and impact analysis
  - GUI and template-based configuration and provisioning
  - Composite L2/L3 service creation and subscriber management
  - Accounting and performance statistics collection and management
  - Security management, including user span of control
  - Mediation for OSS applications
  - OSS Certified Partner program
  - Custom Service Portal

- Alcatel-Lucent 5650 Control Plane Assurance Manager (CPAM)
  - Vendor agnostic route and path analytics
  - IGP routing visualization with 5620 SAM service and MPLS overlay
  - BGP and MP-BGP (for IP VPN) troubleshooting and assurance
  - Historical and real-time path monitoring and protocol audits
  - Automated OAM testing triggered conditionally on routing changes
  - IP routing configuration simulation for "what-if" analysis
  - Troubleshooting and assurance of multicast-based services
  - Path computation for network planning/traffic engineering tool integration
- In-band management
- Telnet
- SNMP v1/v2c/v3
- NTP
- SSH v2/v1
- RMON
- FTP
- TFTP
- SCP (Secure Copy using SSHv2 protocol)
- Syslog

### Security

- IEEE 802.1x on access ports
- Control plane security
  - CPU DOS protection
  - Management access filters
- Radius Client
- TACACS+
- User profile management as in SR OS

### Mechanical specifications

#### Dimensions

- Height: 67 mm (2.64 in.) – 1.5RU
- Width: 436 mm (17.17 in.)
- Depth: 253 mm (9.96 in.)

#### Weight

- 5 kg (11 lbs)

#### LED indicators

- System
- Power supply
- Port status
- Fans
- Alarms

#### Power requirements

- Redundant, hot-swappable power supplies
  - AC input: 100~240 V, 50~60 Hz, output: +12 V DC

→ DC input: -36 V DC to -72 V DC, output: +12 V DC

- Power consumption: 60 W (typical), 205 BTUs per hour

### Environmental specifications

- IEC 68-2-14 (all variants)
- 7210 SAS-M24F2XFP and 7210 SAS-M24F
  - Standard operating temperature: 0°C to 50°C (32°F to 122°F)
  - Non-operating temperature: -10°C to +50°C (14°F to 122°F)
- 7210 SAS-M24F2XFP (ETR)
  - Extended operating temperature: -40°C to +65°C (-40°F to +149°F)

### Safety

- CSA/NRTL (UL60950, CSA 22.2 No 60950-00)
- TUV/GS (EN60950)
- CB

### Electronic magnetic compatibility

- CE Mark
- FCC Class A
- VCCI Class A

### Certifications

- NEBS Level 3 compliant
- Telcordia GR-1089 CORE, Issue 4, June 2006
- Telcordia GR-63 CORE, Issue 3, March 2006
- ATT-TP-76200
- CE
- EN 50121-4 Railway applications: Electromagnetic compatibility; emission and immunity of the signaling and telecommunications apparatus

### Synchronization

- Hardware-ready to support IEEE 1588v2
- Hardware-ready to support ITU-T Synchronous Ethernet standards

### Standards compliance

- IEEE 802.1D Bridging
- IEEE 802.1p/Q VLAN Tagging
- IEEE 802.1w Rapid Spanning Tree Protocol
- IEEE 802.1X Port-Based Network Access Control
- IEEE 802.1ad Provider Bridges
- IEEE 802.1ag Service Layer OAM
- IEEE 802.3ah Ethernet in the First Mile
- IEEE 802.3 10BASE-T
- IEEE 802.3ad Link Aggregation
- IEEE 802.3u 100BASE-TX
- IEEE 802.3z 1000BASE-SX/LX



## Protocol support

### OSPF

- RFC 1765 OSPF Database Overflow
- RFC 2328 OSPF Version 2
- RFC 2370 Opaque LSA Support
- RFC 3101 OSPF NSSA Option
- RFC 3137 OSPF Stub Router Advertisement
- RFC 3623 Graceful OSPF Restart – GR helper
- RFC 3630 Traffic Engineering (TE) Extensions to OSPF Version 2

### IS-IS

- RFC 1142 OSI IS-IS Intra-domain Routing Protocol (ISO 10589)
- RFC 1195 Use of OSI IS-IS for routing in TCP/IP and dual environments
- RFC 2763 Dynamic Hostname Exchange for IS-IS
- RFC 2966 Domain-wide Prefix Distribution with Two-Level IS-IS
- RFC 2973 IS-IS Mesh Groups
- RFC 3373 Three-Way Handshake for Intermediate System to Intermediate System (IS-IS) Point-to-Point Adjacencies
- RFC 3567 Intermediate System to Intermediate System (IS-IS) Cryptographic Authentication
- RFC 3719 Recommendations for Interoperable Networks using IS-IS
- RFC 3784 Intermediate System to Intermediate System (IS-IS) Extensions for Traffic Engineering (TE)
- RFC 3787 Recommendations for Interoperable IP Networks
- RFC 3847 Restart Signaling for IS-IS – GR helper

### MPLS

- RFC 3031 MPLS Architecture
- RFC 3032 MPLS Label Stack Encoding (Rev 3443)
- RFC 4182 Removing a Restriction on the use of MPLS Explicit NULL
- RFC 4379 Detecting Multi-Protocol Label Switched (MPLS) Data Plane Failures

### RSVP-TE

- RFC 2430 A Provider Architecture For Differentiated Services and Traffic Engineering
- RFC 2702 Requirements for Traffic Engineering over MPLS
- RFC 3209 Extensions to RSVP for Tunnels
- RFC 4090 Fast reroute Extensions to RSVP-TE for LSP Tunnels

### Differentiated services

- RFC 2474 Definition of the DS Field IPv4 and IPv6 Headers (Rev.)
- RFC 2597 Assured Forwarding PHB Group (Rev 3260)
- RFC 2598 An Expedited Forwarding PHB
- RFC 2697 A Single Rate Three Color Marker
- RFC 2698 A Two Rate Three Color Marker

### Multicast

- IGMP RFC 2236

### TCP/IP

- RFC 768 UDP
- RFC 1350 The TFTP Protocol (Rev.)
- RFC 791 IP
- RFC 792 ICMP
- RFC 793 TCP
- RFC 826 ARP
- RFC 854 Telnet
- RFC 1519 CIDR
- RFC 1812 Requirements for IPv4 Routers
- RFC 2347 TFTP Option Extension
- RFC 2328 TFTP Blocksize Option
- RFC 2349 TFTP Timeout Interval and Transfer size option

### VPLS

- RFC 4762 Virtual Private LAN Services Using LDP (previously draft-ietf-l2vpn-vpls-ldp-08.txt)

### Pseudowire

- RFC 3916 Requirements for Pseudowire Emulation Edge-to-Edge (PWE3)
- RFC 3985 Pseudowire Emulation Edge-to-Edge (PWE3)

- RFC 4385 Pseudowire Emulation Edge-to-Edge (PWE3) Control Word for Use over an MPLS PSN
- RFC 4446 IANA Allocations for PWE3
- RFC 4447 Pseudowire Setup and Maintenance Using LDP (draft-ietf-pwe3-control-protocol-17.txt)
- RFC 4448 Encapsulation Methods for Transport of Ethernet over MPLS Networks (draft-ietf-pwe3-ethernet-encap-11.txt)
- RFC 5085 Pseudowire Virtual Circuit Connectivity Verification (VCCV): A Control Channel for Pseudowires
- draft-ietf-l2vpn-vpws-iw-oam-02.txt
- draft-ietf-pwe3-oam-msg-map-05-txt
- draft-ietf-pwe3-ms-pw-arch-02.txt
- draft-ietf-pwe3-segmented-pw-05.txt

### RADIUS

- RFC 2865 Remote Authentication Dial In User Service
- RFC 2866 RADIUS Accounting

### SSH

- draft-ietf-secsh-architecture.txt SSH Protocol Architecture
- draft-ietf-secsh-userauth.txt SSH Authentication Protocol
- draft-ietf-secsh-transport.txt SSH Transport Layer Protocol
- draft-ietf-secsh-connection.txt SSH Connection Protocol
- draft-ietf-secsh-newmodes.txt SSH Transport Layer Encryption Modes
- TACACS+
- draft-grant-tacacs-02.txt

### Network management

- ITU-T X.721: Information technology-OSI-Structure of Management Information
- ITU-T X.734: Information technology-OSI-Systems Management: Event Report Management Function
- M.3100/3120 Equipment and Connection Models

- TMF 509/613 Network Connectivity Model
- RFC 1157 SNMPv1
- RFC 1215 A Convention for Defining Traps for use with the SNMP
- RFC 1907 SNMPv2-MIB
- RFC 2011 IP-MIB
- RFC 2012 TCP-MIB
- RFC 2013 UDP-MIB
- RFC 2096 IP-FORWARD-MIB
- RFC 2138 RADIUS
- RFC 2575 SNMP-VIEW-BASE-DACM-MIB
- RFC 2576 SNMP-COMMUNITY-MIB
- RFC 2665 Ether-like MIB
- RFC 2819 RMON-MIB
- RFC 2863 IF-MIB
- RFC 2864 INVERTED-STACK-MIB
- RFC 3014 NOTIFICATION-LOG-MIB
- RFC 3164 Syslog
- RFC 3273 HCRMON-MIB
- RFC 3411 An Architecture for Describing Simple Network Management Protocol (SNMP) Management Frameworks
- RFC 3412 Message Processing and Dispatching for the Simple Network Management Protocol (SNMP)
- RFC 3413 Simple Network Management Protocol (SNMP) Applications
- RFC 3414 User-based Security Model (USM) for version 3 of the Simple Network Management Protocol (SNMPv3)
- RFC 3418 SNMP MIB
- draft-ietf-disman-alarm-mib-04.txt
- IANA-IFType-MIB
- IEEE8023-LAG-MIB

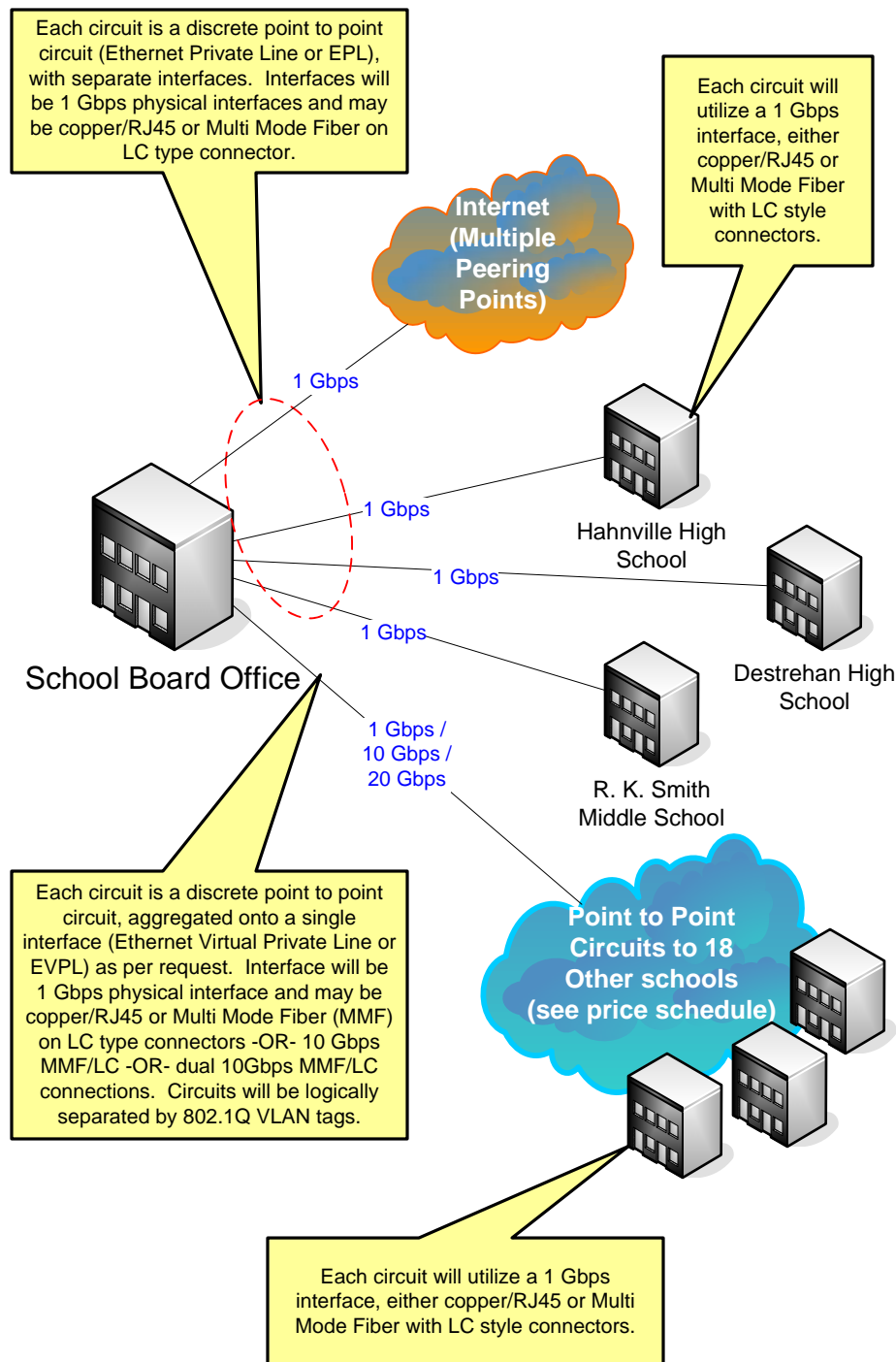
Plus support for an extensive array of proprietary MIBs

**Table 2. Ordering information**

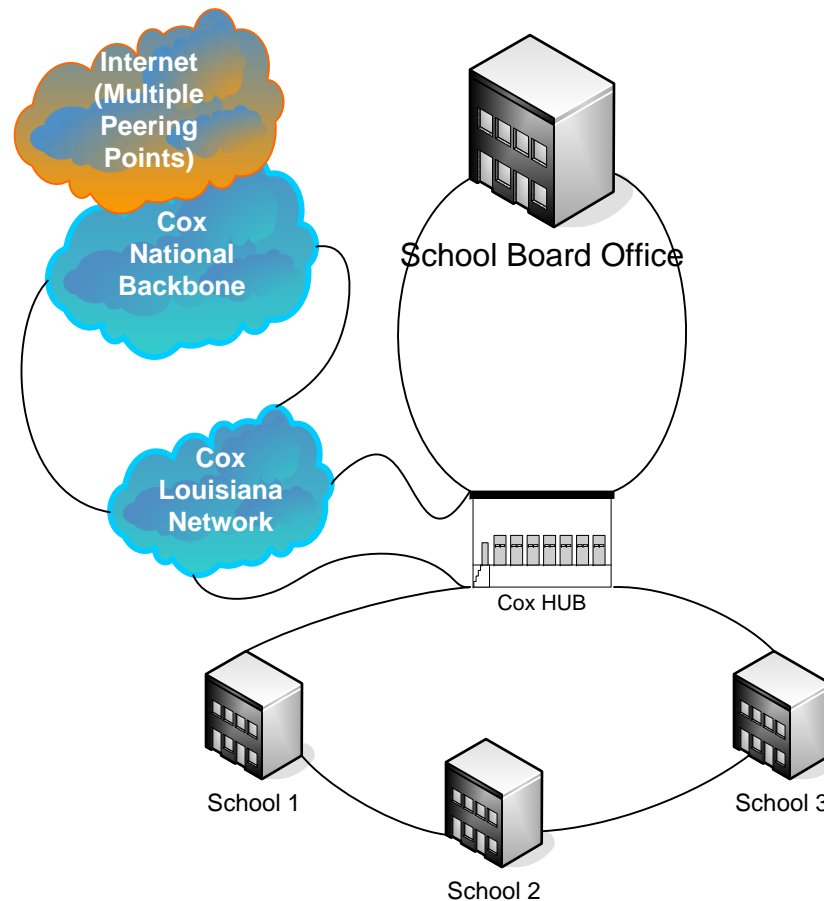
ORDERING CODE	ITEM NAME	DESCRIPTION
3HE05678AA	7210 SAS-M24F2XFP AC Version with NA Power Cord	7210 SAS-M chassis with 2 × 10GigE XFP optical ports, 24 × 100/1000 optical SFP ports, four opto-isolated inputs and two dry relay contact outputs through a DB-15 interface on the front panel, one empty slot for future use, one fan tray, one AC power supply, one power cord for the North American market and Release 1.1 operating system software <ul style="list-style-type: none"> <li>• A second power supply must be installed for redundancy</li> <li>• Optical ports require XFPs and SFPs and must be ordered separately</li> </ul>
3HE05678AB	7210 SAS-M24F2XFP AC Version with UK Power Cord	7210 SAS-M chassis with 2 × 10GigE XFP optical ports, 24 × 100/1000 optical SFP ports, four opto-isolated inputs and two dry relay contact outputs through a DB-15 interface on the front panel, one empty slot for future use, one fan tray, one AC power supply, one power cord for the United Kingdom market and Release 1.1 operating system software <ul style="list-style-type: none"> <li>• A second power supply must be installed for redundancy</li> <li>• Optical ports require XFPs and SFPs and must be ordered separately</li> </ul>
3HE05678AC	7210 SAS-M24F2XFP AC Version with EUR Power Cord	7210 SAS-M chassis with 2 × 10GigE XFP optical ports, 24 × 100/1000 optical SFP ports, four opto-isolated inputs and two dry relay contact outputs through a DB-15 interface on the front panel, one empty slot for future use, one fan tray, one AC power supply, one power cord for the European market and Release 1.1 operating system software <ul style="list-style-type: none"> <li>• A second power supply must be installed for redundancy</li> <li>• Optical ports require XFPs and SFPs and must be ordered separately</li> </ul>
3HE05169AA	7210 SAS-M24F2XFP DC Version	7210 SAS-M chassis with 2 × 10GigE XFP optical ports, 24 × 100/1000 optical SFP ports, four opto-isolated inputs and two dry relay contact outputs through a DB-15 interface on the front panel, one empty slot for future use, one fan tray, one DC power supply and Release 1.1 operating system software <ul style="list-style-type: none"> <li>• A second power supply must be installed for redundancy</li> <li>• Optical ports require XFPs and SFPs and must be ordered separately</li> </ul>
3HE5679AA	7210 SAS-MH24F2XFP AC (ETR) Version with NA Power Cord	7210 SAS-M in a chassis that supports extended temperature ranges with 2 × 10GigE XFP optical ports, 24 × 100/1000 optical SFP ports, four opto-isolated inputs and two dry relay contact outputs through a DB-15 interface on the front panel, one empty slot for future use, one fan tray, one AC power supply, one power cord for the North American market and Release 1.1 operating system software <ul style="list-style-type: none"> <li>• A second power supply must be installed for redundancy</li> <li>• Optical ports require XFPs and SFPs and must be ordered separately</li> </ul>
3HE5679AB	7210 SAS-MH24F2XFP AC (ETR) Version with UK Power Cord	7210 SAS-M in a chassis that supports extended temperature ranges with 2 × 10GigE XFP optical ports, 24 × 100/1000 optical SFP ports, four opto-isolated inputs and two dry relay contact outputs through a DB-15 interface on the front panel, one empty slot for future use, one fan tray, one AC power supply, one power cord for the United Kingdom market and Release 1.1 operating system software <ul style="list-style-type: none"> <li>• A second power supply must be installed for redundancy</li> <li>• Optical ports require XFPs and SFPs and must be ordered separately</li> </ul>
3HE5679AC	7210 SAS-MH24F2XFP AC (ETR) Version with EUR Power Cord	7210 SAS-M in a chassis that supports extended temperature ranges with 2 × 10GigE XFP optical ports, 24 × 100/1000 optical SFP ports, four opto-isolated inputs and two dry relay contact outputs through a DB-15 interface on the front panel, one empty slot for future use, one fan tray, one AC power supply, one power cord for the European market and Release 1.1 operating system software <ul style="list-style-type: none"> <li>• A second power supply must be installed for redundancy</li> <li>• Optical ports require XFPs and SFPs and must be ordered separately</li> </ul>
3HE05590AA	7210 SAS-MH24F2XFP DC (ETR) Version	7210 SAS-M in a chassis that supports extended temperature ranges with 2 × 10GigE XFP optical ports, 24 × 100/1000 optical SFP ports, four opto-isolated inputs and two dry relay contact outputs through a DB-15 interface on the front panel, one empty slot for future use, one fan tray, one DC power supply and Release 1.1 operating system software <ul style="list-style-type: none"> <li>• A second power supply must be installed for redundancy</li> <li>• Optical ports require XFPs and SFPs and must be ordered separately</li> </ul>
3HE05578AA	7210 SAS-M24F AC Version with NA Power Cord	7210 SAS-M chassis with 24 × 100/1000 optical SFP ports, four opto-isolated inputs and two dry relay contact outputs through a DB-15 interface on the front panel, one empty slot for future use, one fan tray, one AC power supply, one power cord for the North American market and Release 1.1 operating system software <ul style="list-style-type: none"> <li>• A second power supply must be installed for redundancy</li> <li>• Optical ports require SFPs and must be ordered separately</li> </ul>
3HE05578AB	7210 SAS-M24F AC Version with UK Power Cord	7210 SAS-M chassis with 24 × 100/1000 optical SFP ports, four opto-isolated inputs and two dry relay contact outputs through a DB-15 interface on the front panel, one empty slot for future use, one fan tray, one AC power supply, one power cord for the United Kingdom market and Release 1.1 operating system software <ul style="list-style-type: none"> <li>• A second power supply must be installed for redundancy</li> <li>• Optical ports require SFPs and must be ordered separately</li> </ul>

**Table 2. Ordering information (continued)**

ORDERING CODE	ITEM NAME	DESCRIPTION
3HE05578AC	7210 SAS-M24F AC Version with EUR Power Cord	7210 SAS-M chassis with 24 × 100/1000 optical SFP ports, four opto-isolated inputs and two dry relay contact outputs through a DB-15 interface on the front panel, one empty slot for future use, one fan tray, one AC power supply, one power cord for the European market and Release 1.1 operating system software <ul style="list-style-type: none"> <li>• A second power supply must be installed for redundancy</li> <li>• Optical ports require SFPs and must be ordered separately</li> </ul>
3HE05029AB	7210 SAS-M24F DC Version	7210 SAS-M chassis with 24 × 100/1000 optical SFP ports, four opto-isolated inputs and two dry relay contact outputs through a DB-15 interface on the front panel, one empty slot for future use, one fan tray, one DC power supply and Release 1.1 operating system software <ul style="list-style-type: none"> <li>• A second power supply must be installed for redundancy</li> <li>• Optical ports require SFPs and must be ordered separately</li> </ul>
3HE04415AA	-48 V DC Power Supply	<ul style="list-style-type: none"> <li>• -48 V DC power supply (one is required; a second is required for optional redundancy)</li> </ul>
3HE04414AA	110-220 V AC Power Supply	<ul style="list-style-type: none"> <li>• 110 V to 220 V AC power supply (one is required; a second is required for optional redundancy)</li> </ul>
3HE05580AA	-48 V DC Power Supply (ETR)	<ul style="list-style-type: none"> <li>• Extended temperature range -48 V DC power supply (one is required; a second is required for optional redundancy)</li> </ul>
3HE05581AA	110-220 V AC Power Supply (ETR)	<ul style="list-style-type: none"> <li>• Extended temperature range 110 V to 220 V AC power supply (one is required; a second is required for optional redundancy)</li> </ul>
3HE04416AA	Fan Tray	<ul style="list-style-type: none"> <li>• Fan tray for all 7210 SAS chassis variants</li> </ul>



## Typical Fiber Ring Deployment



All sites will be deployed with ring protection. Customer entry to site will be collapsed lateral. Dual Entry at sites available upon request. Cox will endeavor to provide physically distinct rings where possible, but as this is not a requirement of the RFP, we cannot guarantee physically distinct rings in all cases unless all bidders also fulfill such requirement. Nodes per ring may vary. School Board Office will be on a stand alone 20 Gbps ring. All other sites will be on at least 2 Gbps rings. 100% of local fiber routes are owned and maintained by Cox Communications. No third parties will be involved in service provisioning. Contractors will be used for physical fiber construction.