



The following documentation is an electronically-submitted vendor response to an advertised solicitation from the *West Virginia Purchasing Bulletin* within the Vendor Self-Service portal at ***wvOASIS.gov***. As part of the State of West Virginia's procurement process, and to maintain the transparency of the bid-opening process, this documentation submitted online is publicly posted by the West Virginia Purchasing Division at ***WVPurchasing.gov*** with any other vendor responses to this solicitation submitted to the Purchasing Division in hard copy format.

Header 3

[List View](#)

General Information

[Contact](#)[Default Values](#)[Discount](#)[Document Information](#)

Procurement Folder: 446251

Procurement Type: Central Purchase Order

Vendor ID: 000000219154

Legal Name: SOFTWARE INFORMATION SYSTEMS LLC

Alias/DBA:

Total Bid: \$633,853.81

Response Date: 05/22/2018

Response Time: 10:12

SO Doc Code: CRFQ

SO Dept: 1300

SO Doc ID: STO1800000003

Published Date: 5/15/18

Close Date: 5/22/18

Close Time: 13:30

Status: Closed

Solicitation Description: Addendum, WVSTO Network Infrastructure Refresh,

Total of Header Attachments: 3

Total of All Attachments: 3

[Apply Default Values to Commodity Lines](#)[View Procurement Folder](#)

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
1	Production Site: Storage Array Solution	1.00000	EA	\$211,074.150000	\$211,074.15

Comm Code	Manufacturer	Specification	Model #
43200000			

Extended Description : Storage Array Solution for Production Site - per Specifications Section 4.1
Vendor should complete Exhibit A - Pricing Page and provide an itemized list with brand, model/part numbers, etc. per category listed

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
2	Disaster Recovery Site: Storage Array Solution	1.00000	EA	\$150,063.220000	\$150,063.22

Comm Code	Manufacturer	Specification	Model #
43200000			

Extended Description : Storage Array Solution for Disaster Recovery Site - per Specifications Section 4.2
Vendor should complete Exhibit A - Pricing Page and provide an itemized list with brand, model/part numbers, etc. per category listed

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
3	Production Site: Compute & Networking Solution	1.00000	EA	\$108,186.740000	\$108,186.74

Comm Code	Manufacturer	Specification	Model #
43200000			

Extended Description : Compute & Networking Solution for Production Site - per Specifications Section 4.3
Vendor should complete Exhibit A - Pricing Page and provide an itemized listing with brand, model/part numbers, etc. per category listed

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
4	Disaster Recovery Site: Compute & Networking Solution	1.00000	EA	\$88,119.740000	\$88,119.74

Comm Code	Manufacturer	Specification	Model #
43200000			

Extended Description : Compute & Networking Solution for Production Site - per Specifications Section 4.4
Vendor should complete Exhibit A-Pricing Page and provide an itemized listing with brand, model/part numbers, etc. per category listed

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
5	Production Site: Cabinet	1.00000	EA	\$2,004.980000	\$2,004.98

Comm Code	Manufacturer	Specification	Model #
43200000			

Extended Description : Cabinet for Production Site - per Specifications Section 4.5
Vendor should complete Exhibit A - Pricing Page and provide an itemized list with brand, model/part numbers, etc. per category listed

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
6	Disaster Recovery Site: Cabinet	1.00000	EA	\$2,004.980000	\$2,004.98

Comm Code	Manufacturer	Specification	Model #
43200000			

Extended Description : Cabinet for Disaster Recovery Site - per Specifications Section 4.6.
Vendor should complete Exhibit A - Pricing Page and provide an itemized list with brand, model/part numbers, etc. per category listed

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
7	Implementation & Migration Services	1.00000	JOB	\$45,000.000000	\$45,000.00

Comm Code	Manufacturer	Specification	Model #
81111706			

Extended Description : Base Implementation & Migration Services, per Specifications Section 4.8
Vendor should complete Exhibit A Pricing Page and provide an itemized list with brand, model/part numbers per category listed

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
8	Post Implementation Services	40.00000	HOUR	\$185.000000	\$7,400.00

Comm Code	Manufacturer	Specification	Model #
81111706			

Extended Description : Post Implementation Services, per Specifications Section 4.8.6
Vendor should complete Exhibit A Pricing Page and provide an itemized list with brand, model/part numbers, etc. per category listed

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
9	Training & Knowledge Transfer	1.00000	EA	\$20,000.000000	\$20,000.00

Comm Code	Manufacturer	Specification	Model #
81111706			

Extended Description : Training & Knowledge Transfer Services, per Specifications Section 4.9
Vendor should complete Exhibit A Pricing Page and provide an itemized list with brand, model/part numbers, etc. per category listed



Strategy | Technology | Results

200 Association Drive
Charleston, WV 25311
304 768-1645
304 768-1671 (fax)



Mr. Guy Nisbet
Department of Administration
Purchasing Division
2019 Washington Street, East
Charleston, WV 25305

May 22, 2018

Dear Mr. Nisbet,

Please find attached the SIS response to CRFQ 1300 STO1800000003 due May 22, 2018. SIS agrees with the requirements of the RFQ and is submitting a response offering the Cisco UCS with NetApp Storage. This response meets or exceeds the mandatory requirements of the RFQ for both the Production and Disaster Recovery sites.

Thank you for the opportunity to submit this response and we look forward to further discussions.

Sincerely,

A handwritten signature in black ink, appearing to read 'CD Arnett', is written over a light blue horizontal line.

Charles D. Arnett
Senior Client Executive
carnett@thinksis.com

Enclosures



Purchasing Division
 2019 Washington Street East
 Post Office Box 50130
 Charleston, WV 25305-0130

State of West Virginia
 Request for Quotation
 21 - Info Technology

Proc Folder: 446251

Doc Description: Addendum, WVSTO Network Infrastructure Refresh,

Proc Type: Central Purchase Order

Date Issued	Solicitation Closes	Solicitation No	Version
2018-05-15	2018-05-22 13:30:00	CRFQ 1300 STO1800000003	2

BID RECEIVING LOCATION

BID CLERK
 DEPARTMENT OF ADMINISTRATION
 PURCHASING DIVISION
 2019 WASHINGTON ST E
 CHARLESTON WV 25305
 US

VENDOR

Vendor Name, Address and Telephone Number:
 Software Information System, LLC
 200 Association Drive, Suite 210
 Charleston, WV 25311
 304 769-1645

FOR INFORMATION CONTACT THE BUYER

Guy Nisbet
 (304) 558-2596
 guy.l.nisbet@wv.gov

Signature X  FEIN # 61-1371685 DATE 5-22-2018

All offers subject to all terms and conditions contained in this solicitation

ADDITIONAL INFORMATION:

Addendum

Addendum No.01, issued and publish to distribute the attached information to the vendor community.

Request for Quotation
(Network Infrastructure)

The West Virginia Purchasing Division is soliciting bids on behalf of the West Virginia State Treasurer's Office ("WV STO") to establish a contract for the replacement of its current Network Infrastructure and obtain Services to assist in the installation and configuration of the new hardware. In addition, assistance will be required in beginning the migration process to move existing file and block level data and virtual machines.

The Vendor shall furnish all materials, labor, equipment, and software license necessary to complete all services per the bid requirements, specifications, and terms and conditions that are apart of the solicitation and attached hereto.

INVOICE TO		SHIP TO	
ACCOUNTS PAYABLE WEST VIRGINIA STATE TREASURERS OFFICE BLDG 1 RM E-145 1900 KANAWHA BLVD E CHARLESTON WV25305 US		STATE OF WEST VIRGINIA VARIOUS LOCATIONS AS INDICATED BY ORDER No City WV 99999 US	

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
1	Production Site: Storage Array Solution	1.00000	EA	<i>\$ 211,074.15</i>	<i>\$ 211,074.15</i>

Comm Code	Manufacturer	Specification	Model #
43200000			

Extended Description :

Storage Array Solution for Production Site - per Specifications Section 4.1
Vendor should complete Exhibit A - Pricing Page and provide an itemized list with brand, model/part numbers, etc. per category listed

INVOICE TO		SHIP TO	
ACCOUNTS PAYABLE WEST VIRGINIA STATE TREASURERS OFFICE BLDG 1 RM E-145 1900 KANAWHA BLVD E CHARLESTON WV25305 US		STATE OF WEST VIRGINIA VARIOUS LOCATIONS AS INDICATED BY ORDER No City WV 99999 US	

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
2	Disaster Recovery Site: Storage Array Solution	1.00000	EA	<i>\$ 150,063.22</i>	<i>\$ 150,063.22</i>

Comm Code	Manufacturer	Specification	Model #
43200000			

Extended Description :

Storage Array Solution for Disaster Recovery Site - per Specifications Section 4.2
Vendor should complete Exhibit A - Pricing Page and provide an itemized list with brand, model/part numbers, etc. per category listed

INVOICE TO		SHIP TO	
ACCOUNTS PAYABLE WEST VIRGINIA STATE TREASURERS OFFICE BLDG 1 RM E-145 1900 KANAWHA BLVD E CHARLESTON WV25305 US		STATE OF WEST VIRGINIA VARIOUS LOCATIONS AS INDICATED BY ORDER No City WV 99999 US	

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
3	Production Site: Compute & Networking Solution	1.00000	EA	<i>\$ 108,186.74</i>	<i>\$ 108,186.74</i>

Comm Code	Manufacturer	Specification	Model #
43200000			

Extended Description :

Compute & Networking Solution for Production Site - per Specifications Section 4.3
 Vendor should complete Exhibit A - Pricing Page and provide an itemized listing with brand, model/part numbers, etc. per category listed

INVOICE TO		SHIP TO	
ACCOUNTS PAYABLE WEST VIRGINIA STATE TREASURERS OFFICE BLDG 1 RM E-145 1900 KANAWHA BLVD E CHARLESTON WV25305 US		STATE OF WEST VIRGINIA VARIOUS LOCATIONS AS INDICATED BY ORDER No City WV 99999 US	

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
4	Disaster Recovery Site: Compute & Networking Solution	1.00000	EA	<i>\$ 88,119.74</i>	<i>\$ 88,119.74</i>

Comm Code	Manufacturer	Specification	Model #
43200000			

Extended Description :

Compute & Networking Solution for Production Site - per Specifications Section 4.4
 Vendor should complete Exhibit A-Pricing Page and provide an itemized listing with brand, model/part numbers, etc. per category listed

INVOICE TO		SHIP TO	
ACCOUNTS PAYABLE WEST VIRGINIA STATE TREASURERS OFFICE BLDG 1 RM E-145 1900 KANAWHA BLVD E CHARLESTON WV25305 US		STATE OF WEST VIRGINIA VARIOUS LOCATIONS AS INDICATED BY ORDER No City WV 99999 US	

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
5	Production Site: Cabinet	1.00000	EA	<i>\$ 2004.98</i>	<i>\$ 2004.98</i>

Comm Code	Manufacturer	Specification	Model #
43200000			

Extended Description :

Cabinet for Production Site - per Specifications Section 4.5

Vendor should complete Exhibit A - Pricing Page and provide an itemized list with brand, model/part numbers, etc. per category listed

INVOICE TO		SHIP TO	
ACCOUNTS PAYABLE WEST VIRGINIA STATE TREASURERS OFFICE BLDG 1 RM E-145 1900 KANAWHA BLVD E CHARLESTON WV25305 US		STATE OF WEST VIRGINIA VARIOUS LOCATIONS AS INDICATED BY ORDER No City WV 99999 US	

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
6	Disaster Recovery Site: Cabinet	1.00000	EA	\$1 2004.98	\$1 2004.98

Comm Code	Manufacturer	Specification	Model #
43200000			

Extended Description :

Cabinet for Disaster Recovery Site - per Specifications Section 4.6.

Vendor should complete Exhibit A - Pricing Page and provide an itemized list with brand, model/part numbers, etc. per category listed

INVOICE TO		SHIP TO	
ACCOUNTS PAYABLE WEST VIRGINIA STATE TREASURERS OFFICE BLDG 1 RM E-145 1900 KANAWHA BLVD E CHARLESTON WV25305 US		STATE OF WEST VIRGINIA VARIOUS LOCATIONS AS INDICATED BY ORDER No City WV 99999 US	

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
7	Implementation & Migration Services	1.00000	JOB	\$1 45,000.00	\$1 45,000.00

Comm Code	Manufacturer	Specification	Model #
81111706			

Extended Description :

Base Implementation & Migration Services, per Specifications Section 4.8

Vendor should complete Exhibit A Pricing Page and provide an itemized list with brand, model/part numbers per category listed

INVOICE TO		SHIP TO	
ACCOUNTS PAYABLE WEST VIRGINIA STATE TREASURERS OFFICE BLDG 1 RM E-145 1900 KANAWHA BLVD E CHARLESTON WV25305 US		STATE OF WEST VIRGINIA VARIOUS LOCATIONS AS INDICATED BY ORDER No City WV 99999 US	

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
8	Post Implementation Services	40.00000	HOUR	\$195.00	\$7,400.00

Comm Code	Manufacturer	Specification	Model #
81111706			

Extended Description :

Post Implementation Services, per Specifications Section 4.8.6
 Vendor should complete Exhibit A Pricing Page and provide an itemized list with brand, model/part numbers, etc. per category listed

INVOICE TO		SHIP TO	
ACCOUNTS PAYABLE WEST VIRGINIA STATE TREASURERS OFFICE BLDG 1 RM E-145 1900 KANAWHA BLVD E CHARLESTON WV25305 US		STATE OF WEST VIRGINIA VARIOUS LOCATIONS AS INDICATED BY ORDER No City WV 99999 US	

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
9	Training & Knowledge Transfer	1.00000	EA	\$20,000.00	\$20,000.00

Comm Code	Manufacturer	Specification	Model #
81111706			

Extended Description :

Training & Knowledge Transfer Services, per Specifications Section 4.9
 Vendor should complete Exhibit A Pricing Page and provide an itemized list with brand, model/part numbers, etc. per category listed

EXHIBIT A – PRICING PAGE

Vendor is to complete this Pricing Page and submit it with its bid response if not responding electronically via wvOASIS. Vendor shall enter the total bid amount (lump sum) per category/line item to provide the Goods and/or Services contemplated and as described in Section 4 of the Specifications for the project in wvOASIS, and/or on the corresponding lines below.

Additionally, Vendor should provide an itemized Build List with the brand, model numbers, etc. for all equipment proposed for each category and location as a separate attachment. Equipment prices for each category/location must include the services as specified in Section 4.7 (Hardware Delivery & Base Implementation Services). Vendor should supply this information with their bid response.

Price shall include a five (5) year warranty on all hardware, equipment, software, and support/licensing upgrade of applicable software from the date of Agency acceptance. Prices shall include all costs, fees, including but not limited to shipping, travel, lodging, meals and other related costs.

Item 1: Storage Array Solution – Production Site (Section 4.1):	\$ <u>211,074.15</u>
Item 2: Storage Array Solution – Disaster Recovery Site (Section 4.2):	\$ <u>150,063.22</u>
Item 3: Compute & Networking Solution – Production Site (Section 4.3)	\$ <u>108,186.74</u>
Item 4: Compute & Networking Solution – Disaster Recovery Site (Section 4.4)	\$ <u>98,119.74</u>
Item 5: Cabinet – Production Site (Section 4.5)	\$ <u>2,004.98</u>
Item 6: Cabinet – Disaster Recovery Site (Section 4.6)	\$ <u>2,004.98</u>
Item 7: Implementation/Migration Services Phase (Section 4.8) (Does not include the post-implementation hours)	\$ <u>45,000.00</u>
Item 8: Post Implementation (as needed) Hours (Section 4.8.6)	
Hourly Rate: \$ <u>95.00</u> x 40 Hours =	\$ <u>7,400.00</u>
Item 9: Knowledge Transfer & Training (Section 4.9)	\$ <u>20,000.00</u>
TOTAL BID AMOUNT (Items 1 – 9)	\$ <u>633,853.81</u>

Itemized Build List

CRFQ 1300 STO1800000003

due 5-22-2018

Storage Array Solution- Production Site

Item	QTY	Part Number	Description (NetAPP)	List Price	Ext Price
1	2	FAS8200A-002	FAS8200 HA System,Premium Bundle Includes all Protocols, SnapRestore,SnapMirror SnapVault, FlexClone, SnapManager Suite, Single Mailbox Recovery (SMBR), Snap Center Foundation	\$22,500.00	\$45,000.00
2	2	X1143A-R6-C	ADPT 2-Pt UTA2,10GbE,16Gb FC BareCage SFP+,-C	\$2,330.00	\$4,660.00
3	2	X6566B-05-R6-C	Cable,Direct Attach CU SFP+10G,0.5M,-C [Cat: C]	\$60.00	\$120.00
4	12	X66250-2-C	Cable,LC-LC,OM4,2m,-C	\$125.00	\$1,500.00
5	8	X66032A-C	Cable,12Gb,Mini SAS HD,2m,-C	\$285.00	\$2,280.00
6	2	X66030A-C	Cable,12Gb,Mini SAS HD,0.5m,-C	\$185.00	\$370.00
7	1	X6235-C	Chassis,FAS8200,AFF-A300,AC PS,-C	\$0.00	\$0.00
8	1	DOC-8200-C	Documents,8200,-C	\$0.00	\$0.00
9	8	X1558A-R6-C	Power Cable,In-Cabinet,48-IN,C13-C14,-C	\$0.00	\$0.00
10	4	X-02659-00-C	Rail Kit,4-Post,Rnd/Sq-Hole,Adj,24-32,-C	\$115.00	\$460.00
11	4	X6602A-R6-C	SFP+ Optical,UTA,16Gb FC Shortwave,-C	\$1,035.00	\$4,140.00
12	8	X6599A-R6-C	SFP+ Optical 10Gb Shortwave,-C	\$795.00	\$6,360.00
13	2	DS224C-10- 1.8-24S-2P-C	DSK SHLF,12G,24x1.8TB,10K,2P,-C	\$19,570.00	\$39,140.00
14	1	DS224C S-.96-24S-2P-CQ	SSD SHLF,12G,24x960GB,2P,CQ	\$43,890.00	\$43,890.00
15	1	SW-2-CL-BASE	SW-2,Base,CL,Node	\$0.00	\$0.00
16	2	SW-2-8200A-NVE-C	SW,Data at Rest Encryption Enabled,8200A,-C	\$0.00	\$0.00
17	2	SW-2-8200A-TPM-C	SW,Trusted Platform Module Enabled,8200A,-C	\$0.00	\$0.00
18	2	DATA-AT-REST-	Data at Rest Encryption Capable Operating Sys	\$0.00	\$0.00
19	864	OS-ONTAP1-	ONTAP,Per-0.1TB,PREMBNDL,Perf,2P,-C	\$99.00	\$85,536.00
20	230	CAP2-PREM-2P-C	ONTAP,Per-0.1TB,PREMBNDL,Ultra-Pef,2P,-C	\$512.00	\$117,760.00
21	1	CS Warranty Extension 60 Month Premium Hardware/Software Support/4HR		\$70,932.30	\$70,932.30
Subtotal					\$422,148.30
Discounted Subtotal					\$211,074.15

Storage Array Solution- Disaster Recovery Site

Item	QTY	Part Number	Description (NetApp)	List Price	Ext Price
1	2	FAS8200A-002	FAS8200 HA System,Premium Bundle Includes all Protocols, SnapRestore,SnapMirror SnapVault, FlexClone, SnapManager Suite, Single Mailbox Recovery (SMBR), Snap Center Foundation	\$22,500.00	\$45,000.00
2	2	X6566B-05-R6-C	Cable,Direct Attach CU SFP+10G,0.5M,-C [Cat: C]	\$60.00	\$120.00
3	12	X66250-2-C	Cable,LC-LC,OM4,2m,-C	\$125.00	\$1,500.00
4	8	X66032A-C	Cable,12Gb,Mini SAS HD,2m,-C	\$285.00	\$2,280.00
5	2	X66030A-C	Cable,12Gb,Mini SAS HD,0.5m,-C	\$185.00	\$370.00
6	1	X6235-C	Chassis,FAS8200,AFF-A300,AC PS,-C	\$0.00	\$0.00
7	1	DOC-8200-C	Documents,8200,-C	\$0.00	\$0.00
8	8	X800-42U-R6-C	Power Cable,In-Cabinet,C13-C-14,-C	\$0.00	\$0.00

9	4	X-02659-00-C	Rail Kit,4-Post,Rnd/Sq-Hole,Adj,24-32,-C	\$115.00	\$460.00
10	8	X6599A-R6-C	SFP+ Optical 10Gb Shortwave,-C	\$795.00	\$6,360.00
11	2	X1143A-R6-C	ADPT 2-Pt UTA2,10GbE,16Gb FC BareCage SFP+,-C	\$2,330.00	\$4,660.00
12	4	X6602A-R6-C	SFP+ Optical,UTA,16Gb FC Shortwave,-C	\$1,035.00	\$4,140.00
13	2	DS224C-10- 1.8-24S-2P-C	DSK SHLF,12G,24x1.8TB,10K,2P,-C	\$19,570.00	\$39,140.00
14	1	DS224C-10- 1.8-24S-2P-CQ	DSK SHLF,12G,24x1.8TB,10K,2P,-CQ	\$19,570.00	\$19,570.00
15	1	SW-2-CL-BASE	SW-2,Base,CL,Node	\$0.00	\$0.00
16	2	SW-2-8200A-NVE-C	SW,Data at Rest Encryption Enabled,8200A,-C	\$0.00	\$0.00
17	2	SW-2-8200A-TPM-C	SW,Trusted Platform Module Enabled,8200A,-C	\$0.00	\$0.00
18	2	DATA-AT-REST- ENCRYPTION	Data at Rest Encryption Capable Operating Sys	\$0.00	\$0.00
19	1296	OS-ONTAP1- CAP2-PREM-2P-C	ONTAP,Per-0.1TB,PREMBNDL,Perf,2P,-C	\$95.29	\$123,495.84
20	1	CS Warranty Extension 60 Month Premium Hardware/Software Support/4HR		\$53,030.59	\$53,030.59

Subtotal
Discounted Subtotal

\$300,126.43
\$150,063.22

Compute & Networking Solution - Production Site

Item	QTY	Part Number	Description (Cisco)	List Price	Ext Price
1	1	UCS-SP-5108-AC3	UCS SP SELECT 5108 AC2 CHASSIS W/2304 IO	\$19,500.00	\$19,500.00
2	4	UCSB-PSU- 2500ACDV	2500W PLATINUM AC HOT PLUG POWER SUPPLYD	\$0.00	\$0.00
3	4	CAB-C19-CBN	CABINET JUMPER POWER CORD, 250 VAC 16A,	\$0.00	\$0.00
4	4	QSFP-H40G-CU3M	40GBASE-CR4 PASSIVE COPPER CABLE, 3M	\$0.00	\$0.00
5	1	N01-UAC1	SINGLE PHASE AC POWER MODULE FOR UCS 510	\$0.00	\$0.00
6	8	N20-CBLKB1	BLADE SLOT BLANKING PANEL FOR UCS 5108/S	\$0.00	\$0.00
7	8	N20-FAN5	FAN MODULE FOR UCS 5108	\$0.00	\$0.00
8	1	N20-CAK	ACCESS. KIT FOR 5108 BLADE CHASSIS INCL	\$0.00	\$0.00
9	1	UCSB-5108-PKG-HW	UCS 5108 PACKAGING FOR CHASSIS WITH HALF	\$0.00	\$0.00
10	2	UCS-IOM-2304	UCS 2304XP I/O MODULE (4 EXTERNAL, 8 INT	\$0.00	\$0.00
11	1	CON-SNTP-5108AC3	SMARTNET 24X7X4, UCS SP SELECT 5108 AC2	\$1,305.00	\$1,305.00
12	1	N20-FW015	UCS 5108 BLADE CHASSIS FW PACKAGE 3.2(1)	\$0.00	\$0.00
13	1	P177/M1	ABI-H158204	\$128.48	\$128.48
14	1	UCS-SP-FI633216-2X	UCS SP SELECT 6332-16UP FI/NO PSU/24 Q	\$0.00	\$0.00
15	2	UCS-SP-FI6332-16UP	(NOT SOLD STANDALONE) UCS 6332-16UP FI/N	\$24,500.00	\$49,000.00
16	4	UCS-PSU-6332-AC	UCS 6332 POWER SUPPLY/100-240VAC	\$0.00	\$0.00
17	4	CAB-C13-C14-2M	POWER CORD JUMPER, C13-C14 CONNECTORS, 2	\$0.00	\$0.00
18	8	QSFP-H40G-CU3M	40GBASE-CR4 PASSIVE COPPER CABLE, 3M	\$0.00	\$0.00

19	8	QSFP-40G-SR-BD	QSFP40G BIDI SHORT-REACH TRANSCEIVER	\$0.00	\$0.00
20	8	DS-SFP-FC16G-SW	16 GBPS FIBRE CHANNEL SW SFP+, LC	\$0.00	\$0.00
21	8	UCS-FAN-6332	UCS 6332 FAN MODULE	\$0.00	\$0.00
22	2	UCS-ACC-6332	UCS 6332 CHASSIS ACCESSORY KIT	\$0.00	\$0.00
23	2	CON-SNTP-SP16UP	SMARTNET 24X7X4 (NOT SOLD STANDALONE) UC	\$10,640.00	\$21,280.00
24	2	N10-MGT015	UCS MANAGER V3.2(1)	\$0.00	\$0.00
25	2	P177/O1	INTEGRATION SERVICES	\$150.00	\$300.00
26	2	UCS-SP-B200M5-CA1	SP B200 M5 W/2X5118,12X16GB MEM,VIC1340	\$0.00	\$0.00
27	2	UCS-SP-B200M5-A1	UCS B200M5 ADV1 2X5118 12X16GB VIC1340	\$16,380.00	\$32,760.00
28	4	UCS-CPU-5118	2.3 GHZ 5118/105W 12C/16.50MB CACHE/DDR4	\$0.00	\$0.00
29	12	UCS-MR-X16G1RS-H	16GB DDR4-2666-MHZ RDIMM/PC4-21300/SINGL	\$0.00	\$0.00
30	2	UCSB-MRAID12G	CISCO FLEXSTORAGE 12G SAS RAID CONTROLLE	\$749.00	\$1,498.00
31	2	UCSB-MLOM-40G-03	CISCO UCS VIC 1340 MODULAR LOM FOR BLADE	\$0.00	\$0.00
32	36	UCS-DIMM-BLK	UCS DIMM BLANKS	\$0.00	\$0.00
33	2	UCSB-HS-M5-R	CPU HEAT SINK FOR UCS B-SERIES M5 CPU SO	\$0.00	\$0.00
34	4	UCSB-LSTOR-BK	FLEXSTORAGE BLANKING PANELS W/O CONTROLL	\$0.00	\$0.00
35	2	UCS-MSTOR-SD	MINI STORAGE CARRIER FOR SD (HOLDS UP T	\$0.00	\$0.00
36	2	UCSB-HS-M5-F	CPU HEAT SINK FOR UCS B-SERIES M5 CPU SO	\$0.00	\$0.00
37	2	CON-SNTP-B200M5A1	SNTC 24X7X4 UCS B200M5 ADV1W/2X5118,12X1	\$2,030.00	\$4,060.00
38	4	UCS-SD-64G-S	64GB SD CARD FOR UCS SERVERS	\$364.00	\$1,456.00
39	2	P177/R1	INTEGRATION SERVICES	\$180.00	\$360.00
40	3	UCS-SP-B200M5-CA2	SP B200 M5 W/2X5118,6X32GB MEM,VIC1340	\$0.00	\$0.00
41	3	UCS-SP-B200M5-A2	UCS B200M5 ADV1 2X5118 6X32GB VIC1341	\$20,941.00	\$62,823.00
42	6	UCS-CPU-5118	2.3 GHZ 5118/105W 12C/16.50MB CACHE/DDR4	\$0.00	\$0.00
43	18	UCS-MR-X32G2RS-H	32GB DDR4-2666-MHZ RDIMM/PC4-21300/DUAL	\$0.00	\$0.00
44	3	UCSB-MRAID12G	CISCO FLEXSTORAGE 12G SAS RAID CONTROLLE	\$749.00	\$2,247.00
45	6	UCS-SD-64G-S	64GB SD CARD FOR UCS SERVERS	\$364.00	\$2,184.00
46	6	UCS-SP-M32G2-RSH	SP 32GB DDR4-2666-MHZ RDIMM/PC4-21300/DU	\$1,807.00	\$10,842.00
47	3	UCSB-MLOM-40G-03	CISCO UCS VIC 1340 MODULAR LOM FOR BLADE	\$0.00	\$0.00
48	48	UCS-DIMM-BLK	UCS DIMM BLANKS	\$0.00	\$0.00
49	3	UCSB-HS-M5-R	CPU HEAT SINK FOR UCS B-SERIES M5 CPU SO	\$0.00	\$0.00
50	6	UCSB-LSTOR-BK	FLEXSTORAGE BLANKING PANELS W/O CONTROLL	\$0.00	\$0.00
51	3	UCS-MSTOR-SD	MINI STORAGE CARRIER FOR SD (HOLDS UP T	\$0.00	\$0.00
52	3	UCSB-HS-M5-F	CPU HEAT SINK FOR UCS B-SERIES M5 CPU SO	\$0.00	\$0.00
53	3	CON-SNTP-B200M5A2	SNTC 24X7X4 UCS B200M5 ADV1W/2X5118,12X3	\$2,030.00	\$6,090.00
54	3	P177/R1	INTEGRATION SERVICES	\$180.00	\$540.00

55	5	C1-CWOM-SVR-EVAL=	C1 ENT CLOUD STE WO PER SVR EVAL	\$0.00	\$0.00
			Subtotal		\$216,373.48
			Discounted Subtotal		\$108,186.74

Compute & Networking Solution - Disaster Recovery Site

Item	QTY	Part Number	Description (Cisco)	List Price	Ext Price
1	1	UCS-SP-5108-AC3	UCS SP SELECT 5108 AC2 CHASSIS W/2304 IO	\$19,500.00	\$19,500.00
2	4	UCSB-PSU-2500ACDV	2500W PLATINUM AC HOT PLUG POWER SUPPLYD	\$0.00	\$0.00
3	4	CAB-C19-CBN	CABINET JUMPER POWER CORD, 250 VAC 16A,	\$0.00	\$0.00
4	4	QSFP-H40G-CU3M	40GBASE-CR4 PASSIVE COPPER CABLE, 3M	\$0.00	\$0.00
5	1	N01-UAC1	SINGLE PHASE AC POWER MODULE FOR UCS 510	\$0.00	\$0.00
6	8	N20-CBLKB1	BLADE SLOT BLANKING PANEL FOR UCS 5108/S	\$0.00	\$0.00
7	8	N20-FAN5	FAN MODULE FOR UCS 5108	\$0.00	\$0.00
8	1	N20-CAK	ACCESS. KIT FOR 5108 BLADE CHASSIS INCL	\$0.00	\$0.00
9	1	UCSB-5108-PKG-HW	UCS 5108 PACKAGING FOR CHASSIS WITH HALF	\$0.00	\$0.00
10	2	UCS-IOM-2304	UCS 2304XP I/O MODULE (4 EXTERNAL, 8 INT	\$0.00	\$0.00
11	1	CON-SNTP-5108AC3	SMARTNET 24X7X4, UCS SP SELECT 5108 AC2	\$1,305.00	\$1,305.00
12	1	N20-FW015	UCS 5108 BLADE CHASSIS FW PACKAGE 3.2(1)	\$0.00	\$0.00
13	1	P177/M1	ABI-H158204	\$128.48	\$128.48
14	1	UCS-SP-FI633216-2X	UCS SP SELECT 6332-16UP FI/NO PSU/24 Q	\$0.00	\$0.00
15	2	UCS-SP-FI6332-16UP	(NOT SOLD STANDALONE) UCS 6332-16UP FI/N	\$24,500.00	\$49,000.00
16	4	UCS-PSU-6332-AC	UCS 6332 POWER SUPPLY/100-240VAC	\$0.00	\$0.00
17	4	CAB-C13-C14-2M	POWER CORD JUMPER, C13-C14 CONNECTORS, 2	\$0.00	\$0.00
18	8	QSFP-H40G-CU3M	40GBASE-CR4 PASSIVE COPPER CABLE, 3M	\$0.00	\$0.00
19	8	QSFP-40G-SR-BD	QSFP40G BIDI SHORT-REACH TRANSCEIVER	\$0.00	\$0.00
20	8	DS-SFP-FC16G-SW	16 GBPS FIBRE CHANNEL SW SFP+, LC	\$0.00	\$0.00
21	8	UCS-FAN-6332	UCS 6332 FAN MODULE	\$0.00	\$0.00
22	2	UCS-ACC-6332	UCS 6332 CHASSIS ACCESSORY KIT	\$0.00	\$0.00
23	2	CON-SNTP-SP16UP	SMARTNET 24X7X4 (NOT SOLD STANDALONE) UC	\$10,640.00	\$21,280.00
24	2	N10-MGT015	UCS MANAGER V3.2(1)	\$0.00	\$0.00
25	2	P177/O1	INTEGRATION SERVICES	\$150.00	\$300.00
26	3	UCS-SP-B200M5-CA2	SP B200 M5 W/2X5118,6X32GB MEM,VIC1340	\$0.00	\$0.00
27	3	UCS-SP-B200M5-A2	UCS B200M5 ADV1 2X5118 6X32GB VIC1341	\$20,941.00	\$62,823.00
28	6	UCS-CPU-5118	2.3 GHZ 5118/105W 12C/16.50MB CACHE/DDR4	\$0.00	\$0.00
29	18	UCS-MR-X32G2RS-H	32GB DDR4-2666-MHZ RDIMM/PC4-21300/DUAL	\$0.00	\$0.00
30	3	UCSB-MRAID12G	CISCO FLEXSTORAGE 12G SAS RAID CONTROLLE	\$749.00	\$2,247.00
31	6	UCS-SD-64G-S	64GB SD CARD FOR UCS SERVERS	\$364.00	\$2,184.00
32	6	UCS-SP-M32G2-RSH	SP 32GB DDR4-2666-MHZ RDIMM/PC4-21300/DU	\$1,807.00	\$10,842.00

33	3	UCSB-MLOM-40G-03	CISCO UCS VIC 1340 MODULAR LOM FOR BLADE	\$0.00	\$0.00
34	48	UCS-DIMM-BLK	UCS DIMM BLANKS	\$0.00	\$0.00
35	3	UCSB-HS-M5-R	CPU HEAT SINK FOR UCS B-SERIES M5 CPU SO	\$0.00	\$0.00
36	6	UCSB-LSTOR-BK	FLEXSTORAGE BLANKING PANELS W/O CONTROLL	\$0.00	\$0.00
37	3	UCS-MSTOR-SD	MINI STORAGE CARRIER FOR SD (HOLDS UP T	\$0.00	\$0.00
38	3	UCSB-HS-M5-F	CPU HEAT SINK FOR UCS B-SERIES M5 CPU SO	\$0.00	\$0.00
39	3	CON-SNTP- B200M5A2	SNTC 24X7X4 UCS B200M5 ADV1W/2X5118,12X3	\$2,030.00	\$6,090.00
40	3	P177/R1	INTEGRATION SERVICES	\$180.00	\$540.00
1	3	C1-CWOM-SVR- EVAL=	C1 ENT CLOUD STE WO PER SVR EVAL	\$0.00	\$0.00
Subtotal					\$176,239.48
Discounted Subtotal					\$88,119.74

Cabinet - Production Site

Item	QTY	Part Number	Description	Price	Ext Price
1	1	AR3100	APC NETSHELTER SX 42U SERVER RACK	\$1,325.00	\$1,325.00
2	2	AP7541	RACK PDU, BASIC, ZERO U, 30A, 200/208V,	\$339.99	\$679.98
Subtotal					\$2,004.98

Cabinet - Disaster Recovery Site

Item	QTY	Part Number	Description	Price	Ext Price
1	1	AR3100	APC NETSHELTER SX 42U SERVER RACK	\$1,325.00	\$1,325.00
2	2	AP7541	RACK PDU, BASIC, ZERO U, 30A, 200/208V,	\$339.99	\$679.98
Subtotal					\$2,004.98

Implementation/Migration Services

\$45,000.00

Post Implementation (as needed) Hours) 40 Hours x \$185.00 :

\$7,400.00

Knowledge Transfer & Training

\$20,000.00

Total

\$633,853.8

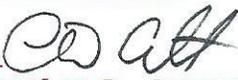
All components will be provided to insure a complete installation that meets the specifications.

VENDOR NAME: Software Information Systems, LLC

FEIN: 61-1371685

PHONE NUMBER: 304 768-1645

VENDOR SIGNATURE


Charles D. Arnett

DESIGNATED CONTACT: Vendor appoints the individual identified in this Section as the Contract Administrator and the initial point of contact for matters relating to this Contract.

Charles D. Arnett, Sr. Client Executive
(Name, Title)

(Printed Name and Title)

200 Association Drive Suite 210, Charleston, WV 25311
(Address)

304 768-1645 Fax 304 768-1671
(Phone Number) / (Fax Number)

carnetto@thinksis.com
(email address)

CERTIFICATION AND SIGNATURE: By signing below, or submitting documentation through wvOASIS, I certify that I have reviewed this Solicitation in its entirety; that I understand the requirements, terms and conditions, and other information contained herein; that this bid, offer or proposal constitutes an offer to the State that cannot be unilaterally withdrawn; that the product or service proposed meets the mandatory requirements contained in the Solicitation for that product or service, unless otherwise stated herein; that the Vendor accepts the terms and conditions contained in the Solicitation, unless otherwise stated herein; that I am submitting this bid, offer or proposal for review and consideration; that I am authorized by the vendor to execute and submit this bid, offer, or proposal, or any documents related thereto on vendor's behalf; that I am authorized to bind the vendor in a contractual relationship; and that to the best of my knowledge, the vendor has properly registered with any State agency that may require registration.

Software Information Systems LLC
(Company)

Charles D. Arnett, Sr. Client Executive
(Authorized Signature) (Representative Name, Title)

Charles D. Arnett Sr. Client Executive
(Printed Name and Title of Authorized Representative)

5-22-2018
(Date)

304 768-1645 Fax 304 768-1671
(Phone Number) (Fax Number)

ADDENDUM ACKNOWLEDGEMENT FORM
SOLICITATION NO.: _____

Instructions: Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

Acknowledgment: I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

Addendum Numbers Received:

(Check the box next to each addendum received)

- | | |
|--|--|
| <input checked="" type="checkbox"/> Addendum No. 1 | <input type="checkbox"/> Addendum No. 6 |
| <input type="checkbox"/> Addendum No. 2 | <input type="checkbox"/> Addendum No. 7 |
| <input type="checkbox"/> Addendum No. 3 | <input type="checkbox"/> Addendum No. 8 |
| <input type="checkbox"/> Addendum No. 4 | <input type="checkbox"/> Addendum No. 9 |
| <input type="checkbox"/> Addendum No. 5 | <input type="checkbox"/> Addendum No. 10 |

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

Software Information Systems, LLC
Company

Charles D. Arnett
Authorized Signature

5-22-2018
Date

NOTE: This addendum acknowledgement should be submitted with the bid to expedite document processing.
Revised 6/8/2012

11.1 The following shall be considered a vendor default under this Contract.

11.1.1 Failure to provide Contract Items in accordance with the requirements contained herein.

11.1.2 Failure to comply with other specifications and requirements contained herein.

11.1.3 Failure to comply with any laws, rules, and ordinances applicable to the Contract Services provided under this Contract.

11.1.4 Failure to remedy deficient performance upon request.

11.2 The following remedies shall be available to Agency upon default.

11.2.1 Immediate cancellation of the Contract.

11.2.2 Immediate cancellation of one or more release orders issued under this Contract.

11.2.3 Any other remedies available in law or equity.

12. MISCELLANEOUS:

12.1 Contract Manager: During its performance of this Contract, Vendor must designate and maintain a primary contract manager responsible for overseeing Vendor's responsibilities under this Contract. The Contract manager must be available during normal business hours to address any customer service or other issues related to this Contract. Vendor should list its Contract manager and his or her contact information below.

Contract Manager: Charles D Arnett
(Printed/Typed Name)

Telephone Number: 304 768-1645

Fax Number: 304 768-1671

Email Address: carnett@thinksis.com

West Virginia Ethics Commission
Disclosure of Interested Parties to Contracts

(Required by W. Va. Code § 6D-1-2)

Contracting Business Entity: Software Fabrication Systems LLC Address: 210 Association Drive Suite 210

Charleston, WV 25311

Authorized Agent: Charles D. Arnett Address: _____

Contract Number: ST01800000003 Contract Description: Network Infrastructure Refresh

Governmental agency awarding contract: _____

Check here if this is a Supplemental Disclosure

List the Names of Interested Parties to the contract which are known or reasonably anticipated by the contracting business entity for each category below (attach additional pages if necessary):

1. Subcontractors or other entities performing work or service under the Contract

Check here if none, otherwise list entity/individual names below.

2. Any person or entity who owns 25% or more of contracting entity (not applicable to publicly traded entities)

Check here if none, otherwise list entity/individual names below.

3. Any person or entity that facilitated, or negotiated the terms of, the applicable contract (excluding legal services related to the negotiation or drafting of the applicable contract)

Check here if none, otherwise list entity/individual names below.

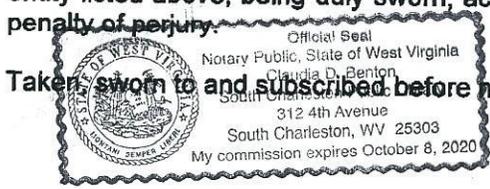
Signature: 

Date Signed: 5-19-2018

Notary Verification

State of West Virginia, County of Kanawha:

I, Charles D. Arnett, the authorized agent of the contracting business entity listed above, being duly sworn, acknowledge that the Disclosure herein is being made under oath and under the penalty of perjury.



Taken, sworn to and subscribed before me this 19th day of May, 2018
Claudia D. Benton
Notary Public's Signature

To be completed by State Agency:

Date Received by State Agency: _____

Date submitted to Ethics Commission: _____

Governmental agency submitting Disclosure: _____

STATE OF WEST VIRGINIA
Purchasing Division

PURCHASING AFFIDAVIT

CONSTRUCTION CONTRACTS: Under W. Va. Code § 5-22-1(i), the contracting public entity shall not award a construction contract to any bidder that is known to be in default on any monetary obligation owed to the state or a political subdivision of the state, including, but not limited to, obligations related to payroll taxes, property taxes, sales and use taxes, fire service fees, or other fines or fees.

ALL CONTRACTS: Under W. Va. Code §5A-3-10a, no contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and: (1) the debt owed is an amount greater than one thousand dollars in the aggregate; or (2) the debtor is in employer default.

EXCEPTION: The prohibition listed above does not apply where a vendor has contested any tax administered pursuant to chapter eleven of the W. Va. Code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

DEFINITIONS:

"Debt" means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

"Employer default" means having an outstanding balance or liability to the old fund or to the uninsured employers' fund or being in policy default, as defined in W. Va. Code § 23-2c-2, failure to maintain mandatory workers' compensation coverage, or failure to fully meet its obligations as a workers' compensation self-insured employer. An employer is not in employer default if it has entered into a repayment agreement with the Insurance Commissioner and remains in compliance with the obligations under the repayment agreement.

"Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceed five percent of the total contract amount.

AFFIRMATION: By signing this form, the vendor's authorized signer affirms and acknowledges under penalty of law for false swearing (W. Va. Code §61-5-3) that: (1) for construction contracts, the vendor is not in default on any monetary obligation owed to the state or a political subdivision of the state, and (2) for all other contracts, that neither vendor nor any related party owe a debt as defined above and that neither vendor nor any related party are in employer default as defined above, unless the debt or employer default is permitted under the exception above.

WITNESS THE FOLLOWING SIGNATURE:

Vendor's Name: Software Information Systems, LLC

Authorized Signature: [Signature] Date: 5-19-2019

State of West Virginia

County of Kanawha, to-wit:

Taken, subscribed, and sworn to before me this 19th day of May, 2018.

My Commission expires October 8, 2020.

AFFIX SEAL HERE



NOTARY PUBLIC

[Signature]

Cisco UCS 5108 Blade Server Chassis

Overview

The UCS 5108 Series Blade Server Chassis accommodates up to eight half-width blade servers such as the UCS B230 Blade Server, or 4 full-width blade servers such as the UCS B440 Blade Server and has two I/O bays for IO extenders such as the UCS 2104XP Fabric extender. The chassis requires 6RU in an industry standard cabinet such as the Cisco R Series Racks.

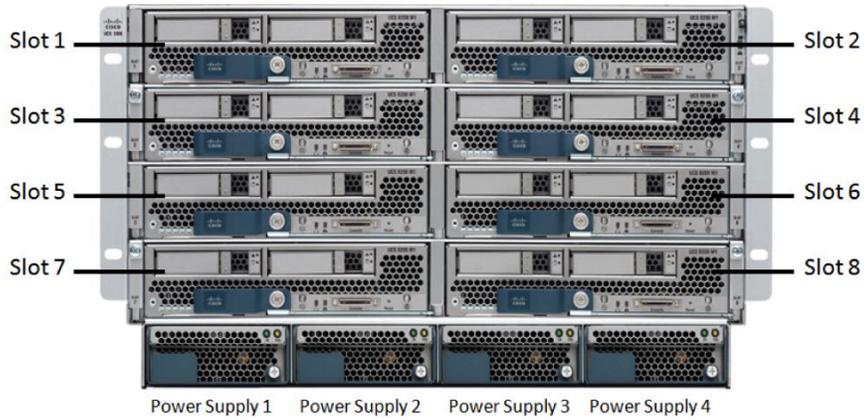
Figure 1. Cisco UCS 5108 Blade Server Chassis



Contents: [Overview](#) [Detailed View](#) [Chassis Features](#) [Configuring](#) [Software](#) [Services](#)
[Product Notes](#) [Physical Specs](#) [Power Specs](#) [Environmental Specs](#)

Detailed Views

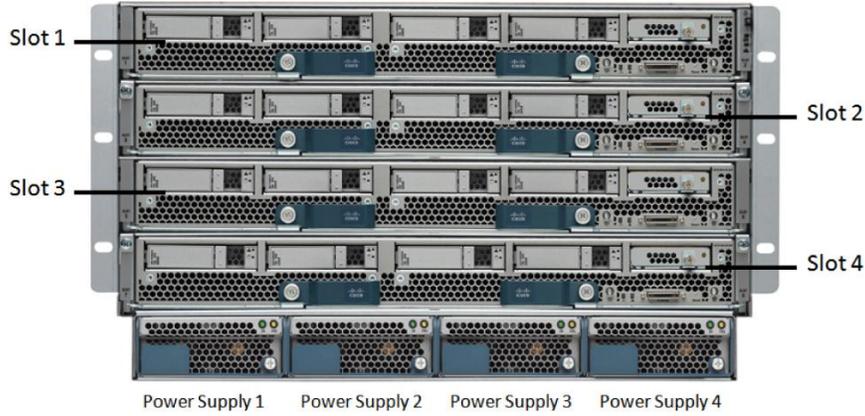
Figure 2. Front View of the Cisco UCS 5108 Blade Server Chassis with eight half-width blade servers



Front Panel Features	
Slot 1-8	Blade Server slots for half-width blade servers
Power supply 1-4	4 x 2500W Power Supplies

Contents: [Overview](#) [Detailed View](#) [Chassis Features](#) [Configuring](#) [Software](#) [Services](#)
[Product Notes](#) [Physical Specs](#) [Power Specs](#) [Environmental Specs](#)

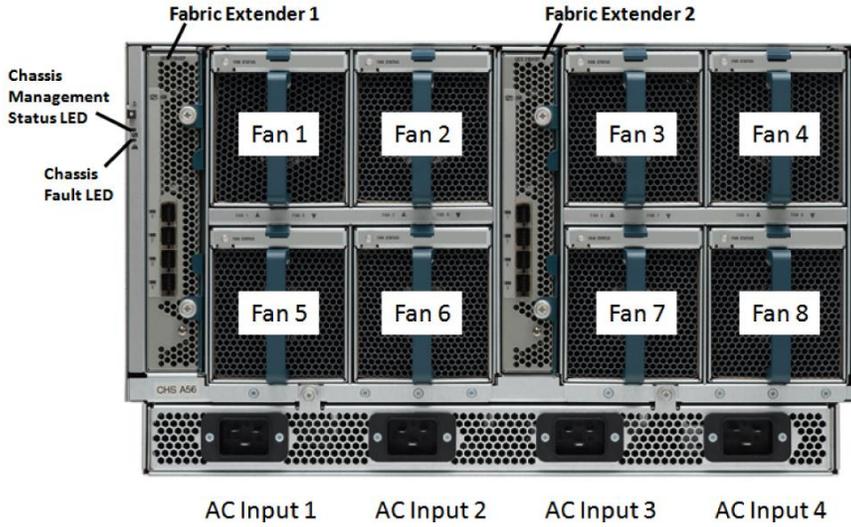
Figure 3. Front View of the Cisco UCS 5108 Blade Server Chassis with four full-width blade servers



Front Panel Features	
Slot 1-4	Blade Server slots for full-width blade servers
Power supply 1-4	4 x 2500W Power Supplies

Contents: Overview	Detailed View	Chassis Features	Configuring	Software	Services
Product Notes	Physical Specs	Power Specs	Environmental Specs		

Figure 4. Rear View of the Cisco UCS 5108 Blade Server Chassis



Contents: [Overview](#) [Detailed View](#) [Chassis Features](#) [Configuring](#) [Software](#) [Services](#)
[Product Notes](#) [Physical Specs](#) [Power Specs](#) [Environmental Specs](#)

Figure 5. The Cisco UCS 2104XP Fabric Extender Module

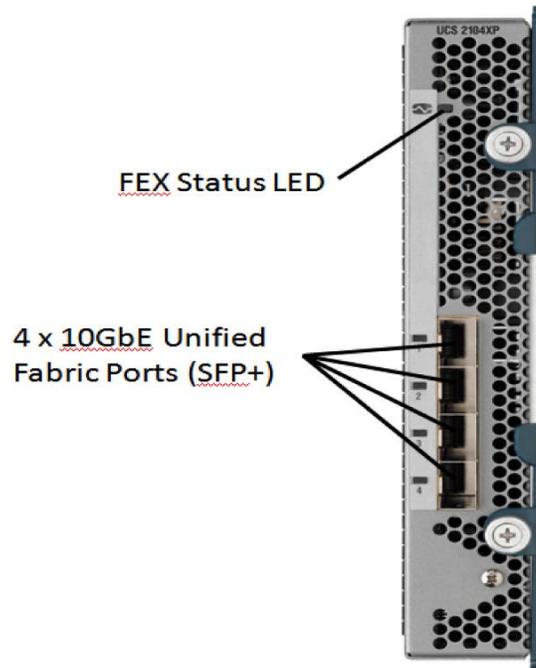


Figure 6. Connector for the KVM Console on the Cisco UCS 5108 Server Chassis

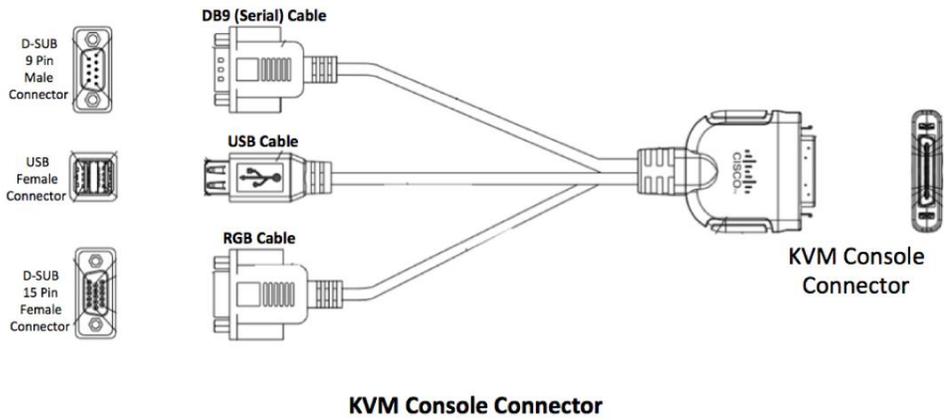


Figure 7. Fan Module for the Cisco UCS 5108 Blade Server Chassis



Contents: [Overview](#) [Detailed View](#) [Chassis Features](#) [Configuring](#) [Software](#) [Services](#)
[Product Notes](#) [Physical Specs](#) [Power Specs](#) [Environmental Specs](#)

Chassis Features

Table 1. Feature Specifications for the Cisco UCS 5108 Blade Server Chassis

Feature	Benefit
Management by Cisco UCS Manager	<ul style="list-style-type: none"> Reduces TCO by removing management modules from the chassis, making the chassis stateless, and UCS systems management inherently scalable Provides a single, highly available management domain for all system chassis, reducing administrative tasks through automated service profile configuration
Unified fabric	Decreases TCO by reducing the number of network interface cards (NICs), host bus adapters (HBAs), switches, and cables needed
Support for one or two Cisco UCS 2100 Series Fabric Extenders	<ul style="list-style-type: none"> Eliminates switches from the chassis along with complex configuration and management of those switches, allowing a system to scale without adding complexity and cost Allows use of two fabric extenders for redundancy or aggregation of bandwidth Enables bandwidth scaling based on application needs; blades can be configured for 1.25 Gbps to 10 Gbps or more
Auto-discovery	Requires no configuration; like all components in the Cisco Unified Computing System, chassis are automatically recognized and configured by Cisco UCS Manager and its service profiles and service profile groups
High-performance mid-plane	<ul style="list-style-type: none"> Provides investment protection Supports up to 2x 40 Gigabit Ethernet for every blade server slot when available Provides 8 blades with 1.2 terabits (Tb) of available Ethernet throughput for future I/O requirements Provides reconfigurable chassis to accommodate a variety of form factors and functions
Redundant hot-swappable power supplies and fans	<ul style="list-style-type: none"> Provides high availability in multiple configurations Increases serviceability Provides uninterrupted service during maintenance
Hot-swappable blade servers and fabric extenders	Provides uninterrupted service during maintenance and server deployment
Comprehensive monitoring	<ul style="list-style-type: none"> Provides extensive environmental monitoring on each chassis Allows use of user thresholds to optimize environmental management of the chassis
Thermal efficiencies	The Chassis Management Controller (CMC) monitors all the temperature sensors and regulates fan speeds to maintain efficient air flow in the deep plenum design while minimizing energy usage. The open backplane architecture based upon FCoE interconnects allows for increased air flow through more open space for airflow.
Tool-free installation	<ul style="list-style-type: none"> Requires no specialized tools for chassis installation Provides mounting rails for easy installation and servicing
Mixed blade configurations	The UCS 5108 Server Chassis can accommodate a maximum of 8 half-width server blades or 4 full-width server blades or any combination thereof.

Contents: [Overview](#) [Detailed View](#) [Chassis Features](#) [Configuring](#) [Software](#) [Services](#)
[Product Notes](#) [Physical Specs](#) [Power Specs](#) [Environmental Specs](#)

Configuring the Cisco UCS 5108 Blade Server Chassis

Cisco UCS 5108 Blade Server Chassis (includes the items shown below) N20-C6508

The Cisco UCS 5108 Blade Server Chassis comes standard with:

Chassis Accessory Kit (N20-CAK),

- One Rail kit (N20-CRMK2) that supports square-holed racks (or round hole racks with an optional adapter - see below)
- KVM local console connector dongle cable that connects to. N20-BKVM=
the front of any UCS blade server, and documentation
- Eight redundant and hot-swappable fan modules N20-FAN5

Chassis additional items (NOT included with the chassis, which may be ordered separately)

- Additional or spare rail kit for the Cisco UCS 5108 chassis. N20-CRMK2=
- Round hole adapter kit (for threaded and non-threaded holes) for the rail kit N20-CRMK2-RHA=
(N20-CRMK2) included with the chassis.

Note: This adapter kit only works with the rail kit N20-CRMK2, and not the earlier.

STEP 1: Select the I/O fabric extender.

Select a minimum of 1 and up to two fabric extenders.

- UCS 2104XP Fabric Extender. N20-I6584

Note: Each fabric extender provides four ports of 10 Gigabit Ethernet, and Fibre Channel over Ethernet (FCoE) connection to the Fabric Interconnect 6100 series modules.

Contents: [Overview](#) [Detailed View](#) [Chassis Features](#) [Configuring](#) [Software](#) [Services](#)
[Product Notes](#) [Physical Specs](#) [Power Specs](#) [Environmental Specs](#)

I/O Additional components (optional).

Transceivers

Select up to four Small Form-Factor Pluggable Plus (SFP+) (choose copper or fiber) per UCS 2104 Fabric Extender.

SFP+ Transceivers

Bidirectional device with transmitter and receiver in same physical package.

- 10 Gigabit Ethernet - short range SFP+ module (MMF) SFP-10GB-SR
- 10 Gigabit Ethernet - long range SFP+ module (SMF) SFP-10GB-LR
- 10 Gigabit Ethernet-FET SFP+ module (MMF) FET-10G

SFP Transceivers

Bidirectional, transmitter and receiver, within the same physical package.

- 1 GbE copper SFP Module GLC-T
- 1 GbE short range (550m max) SFP Module GLC-SX-MM
- 1 GbE long range (10km max) SFP Module GLC-LH-SM

- 1 GbE SFP, extended temperature range Module SFP-GE-T
- 1 GbE SFP, LC connector SX transceiver (MMF), ext. temp. range and DOM SFP-GE-S
- 1 GbE SFP, LC connector LX/LH transceiver (SMF), ext. temp. range and DOM SFP-GE-L

SFP+ Copper Cables

Copper cables are available for use with the 10GbE SFP+ modules.

- 10 G Base-CU SFP+, 1 meter (Twinax cable) SFP-H10GB-CU1M
- 10 G Base-CU SFP+, 3 meter (Twinax cable) SFP-H10GB-CU3M
- 10 G Base-CU SFP+, 5 meter (Twinax cable) SFP-H10GB-CU5M

- 10 G Base-CU SFP+, 7 meter (Twinax cable) SFP-H10GB-ACU7M
- 10 G Base-CU SFP+, 10 meter (Twinax cable) SFP-H10GB-ACU10M

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SFP Fibre Channel Tranceivers

Support for multi-mode 850nm 4Gbs SFPs with 150m reach.

- | | |
|-----------------------------------|----------------|
| • 4 Gbs Fibre Channel-SW SFP, LC | DS-SFP-FC4G-SW |
| • 4 Gbs Fibre Channel-SW SFP, LC | DS-SFP-FC4G-LW |
| • 8 Gbs Fibre Channel-SW SFP+, LC | DS-SFP-FC8G-SW |
| • 8 Gbs Fibre Channel-SW SFP+, LC | DS-SFP-FC8G-LW |

STEP 2: Select the power supplies.

Select a minimum of one and a maximum of four power supplies

- | | |
|--|----------------|
| • 2500W power supply, redundant and hot-swappable. | N20-PAC5-2500W |
|--|----------------|

STEP 3: Select the power cords.

Select a minimum of one and a maximum of 4 power cables from this list:

- | | |
|--|-------------------|
| • AC Power Cable, 16A, 250V, Europe | CAB-AC-2500W-EU |
| • AC Power Cable, BS-1363 to IEC-C19 14ft United Kingdom | CAB-CS1363-C19-UK |
| • AC Power Cable, CEI 23-16 to IEC-C19, 14ft, Italy | CAB-C2316-C19-IT |
| • AC Power Cable, 16A, 250V, Switzerland | CAB-ACS-16 |
| • AC Power Cable, 16A, 250V, International | CAB-AC-2500W-INT |
| • AC Power Cable, 16A, 250V, China | CAB-AC-16AC-CH |
| • AC Power Cable, 16A, 250V, C19, Australia | CAB-AC-16A-AUS |
| • AC Power Cable, Japan power option | CAB-DS-ACJ-TWLK |

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- AC Power Cable, 16A, 250VAC, twist lock NEMA L6-20 plug, US CAB-AC-C6K-TWLK
- AC Power Cable, 16A, 250VAC, Straight blade NEMA L6-20 plug, US CAB-AC-2500W-US1
- AC Power Cable, 16A, 250V, Israel CAB-AC-2500W-ISRL
- AC Power Cable, S132 to IEC-C19, 14ft, Israel CAB-S132-C19-ISRL
- AC Power Cable, SABS 164-1 to IEC-C19 India CAB-SABS-C19-IND
- AC Power Cable, IRSM 2073 to IEC-C19, 14ft, Argentina CAB-IR2073-C19-AR
- AC Power Cable, NBR 14136 to C19, 14ft, Brazil UCSB-CABL-C19-BRZ
- Cabinet Jumper Cord, 250V, 16A, C20-C19 connectors CAB-C19-CBN

STEP 4: Select the chassis wide operating system. (optional).

A variety of operating system options are available.

- SLES 11 media only (multilingual) SLES-11
- SLES/1yr subscription/svcs required/0 media SLES-CA-1A
- SLES/3yr subscription/svcs required/0 media SLES-CA-3A

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STEP 5: Select the appropriate Services. (optional).

A variety of Service options are available, as listed here.

Unified Computing Mission Critical Service

This service delivers personalized technical account management, expedited technical support, and expert field support engineering for the Cisco Unified Computing System (UCS).

The Mission Critical Support Service provides a designated technical account manager (TAM) who acts as a strategic resource to help assure the unified computing environment runs at peak efficiency. Should a problem arise that threatens business continuity, the TAM provides crisis management leadership, and customer IT staff gets expedited access to Cisco's award-winning Technical Assistance Center (TAC).

Please note: This service has qualification criteria. There should be \$1.2M of UCS equipment, 200 blades and a single location to qualify for this service level.

- UC Mission Critical 24x7x4 On-site CON-UCM7-2C6508
- UC Mission Critical 24x7x2 On-site CON-UCM8-2C6508

Unified Computing Support Service.

For support of the entire Unified Computing System, Cisco offers the Cisco Unified Computing Support Service. This service provides expert software and hardware support to help sustain performance and high availability of the unified computing environment. Provided is the access to the award-winning Cisco Technical Assistance Center (TAC) around the clock, from anywhere in the world.

For UCS blade servers, there is Smart Call Home, which provides proactive, embedded diagnostics and real-time alerts. For systems that include the Unified Computing System Manager, the support service includes downloads of UCSM upgrades. The Unified Computing Support Service includes flexible hardware replacement options, including replacement in as little as two hours. There is also access to Cisco's extensive online technical resources to help maintain optimal efficiency and uptime of the unified computing environment.

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- UC Support 8X5XNBD Not on-site CON-UCS1-2C6508
- UC Support 8X5X4 Not on-site CON-UCS2-2C6508
- UC Support 24x7x4 Not on-site CON-UCS3-2C6508
- UC Support 24x7x2 Not on-site CON-UCS4-2C6508

- UC Support 8X5XNBD On-site CON-UCS5-2C6508
- UC Support 8X5X4 On-site CON-UCS6-2C6508
- UC Support 24x7x4 On-site CON-UCS7-2C6508
- UC Support 24x7x2 On-site CON-UCS8-2C6508

Unified Computing Warranty Plus Service.

For faster parts replacement than is provided with the standard Cisco Unified Computing System warranty, Cisco offers the Cisco Unified Computing Warranty Plus Service. Customers can choose from several levels of advanced parts replacement coverage, including onsite parts replacement in as little as two hours. Warranty Plus provides remote access any time to Cisco support professionals who can determine if a return materials authorization (RMA) is required.

- UC Warranty Plus 24x7x4 CON-UCW3-2C6508
- UC Warranty Plus 8X5XNBD On- Site CON-UCW5-2C6508

For more information, see

[Unified Computing Warranty and Support Services.](#)

For a complete listing of available Services for Cisco Unified Computing System:

[Unified Computing Services](#)

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Product Notes

UCS 2104XP Fabric Extender Notes

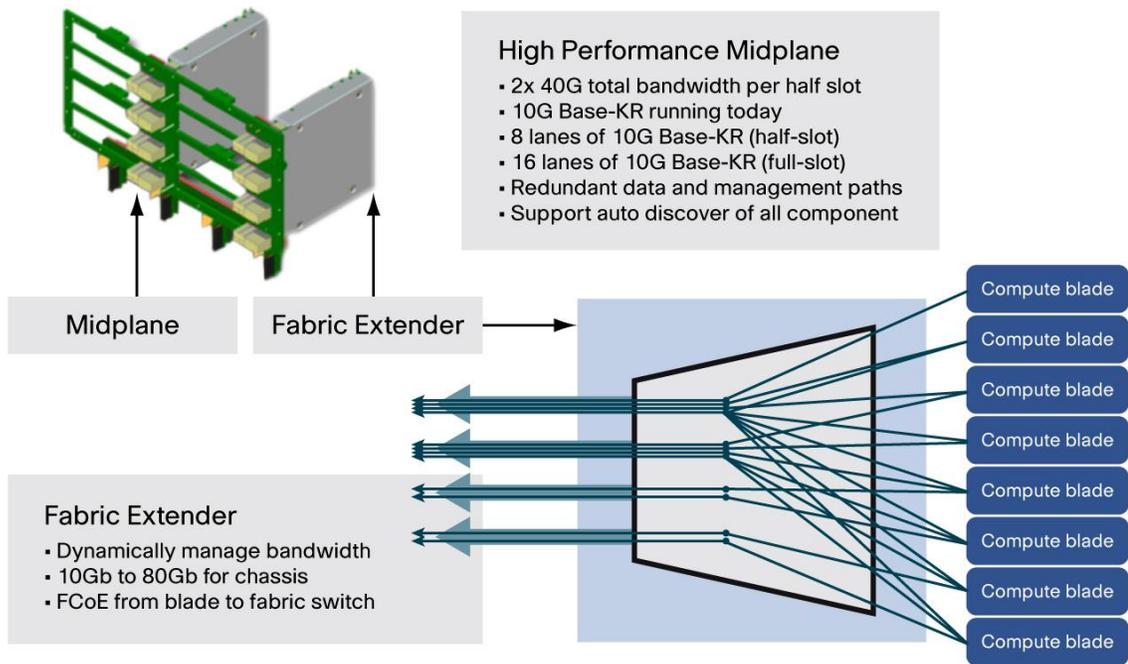
The UCS 2104 Fabric Extender acts a bridge between the blades and fabric interconnects. It helps users manage available bandwidth for the chassis. The 2104XP has four 10GbE links to the blades and includes software to enable discovery, overall chassis health, control fan speeds, and power supplies through the Chassis Management Controller (CMC).

The CMC monitors all the temperature sensors and regulates fan speeds to maintain efficient air flow in the deep plenum design while minimizing energy. The open backplane architecture based upon FCoE interconnects allows for increased air flow through more open space for airflow.

The UCS 2104XP Fabric Extender supports Twinax copper-cable transceivers. The enhanced Small Form-Factor Pluggable SFP+ 10GbE transceiver module is a bidirectional device with a transmitter and receiver in the same physical package. It has a twenty pin connector on the electrical interface.

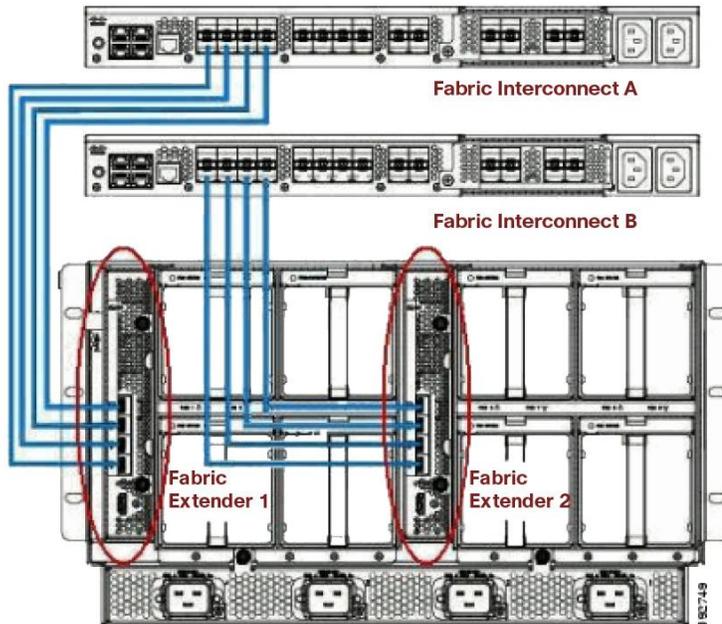
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Figure 8. Illustrates the UCS 5108 Blade Server Chassis backplane with the UCS 2104XP Fabric Extender



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Figure 10. Illustrates the UCS 5108 Blade Server Chassis backplane with the UCS 2104XP Fabric Extender connected to two UCS 6120XP Fabric Interconnects



Technical Specifications

Physical Dimensions Specifications

Table 2. Specifications for the Cisco UCS 5108 Blade Server Chassis

Item	Specification
Height	10.5 in. (26.7 cm); 6 rack unit (6RU)
Width	17.5 in. (44.5 cm); fits standard 19-inch square-hole rack (or round hole threaded or non-threaded, with optional adapter kit)
Depth	32 in. (81.2 cm)
Weight	90 lbs (40.83 kg) empty, 255 lbs (115.66 kg) fully configured
Blade server slots	8 half-width slots, 4 full-width slots or combination of half and full-width thereof.
Fabric Extender slots	2
Fabric Extenders	4 x 10 Gigabit Ethernet uplink ports and 8 x 10 Gigabit Ethernet downlink ports to server (Fibre Channel over Ethernet [FCoE] capable) per Cisco UCS 2100 Series Fabric Extender module
Power	Four 2500W output, 200V - 240V, 50 to 60 Hz, single-phase, hot-swappable, redundant power supplies, with IEC-320 C20 connections
Fans	8 hot-swappable fans
Management	Managed from the Cisco UCS 6100 Series Fabric Interconnects by Cisco UCS Manager (redundant management operations when the chassis is configured with two fabric extenders)
Backplane	1.2 Tb of aggregate throughput; supports 10BASE-KR connections for 8 blades
Regulatory compliance	Products should comply with CE Markings per directives 2004/108/EC and 2006/108/EC
Safety	<ul style="list-style-type: none">• UL 60950-1• CAN/CSA-C22.2 No. 60950-1• EN 60950-1• IEC 60950-1• AS/NZS 60950-1• GB4943
EMC: Emissions	<ul style="list-style-type: none">• 47CFR Part 15 (CFR 47) Class A• AS/NZS CISPR22 Class A• CISPR2 2 Class A• EN55022 Class A• ICES003 Class A• VCCI Class A• EN61000-3-2• EN61000-3-3• KN22 Class A• CNS13438 Class A
EMC: Immunity	<ul style="list-style-type: none">• EN50082-1• EN61000-6-1• EN55024• CISPR24• EN300386• KN 61000-4 Series

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Power Specifications

Table 3. Power Specifications for the Cisco UCS 5108 Blade Server Chassis

Description	Specification			
AC-input voltage	200 to 240 VAC nominal (Range: 180 to 264 VAC)			
AC-input frequency	50 to 60 Hz nominal (Range: 47 to 63 Hz)			
Maximum AC-input current	15.5 Amps @ 200 VAC			
Maximum Input VA	2790 VA @ 200 VAC			
Maximum output power per power supply	2500 W @ 200 to 240 VAC (up to four power supplies)			
Efficiency (80Plus Gold Certified)	10%	20%	50%	100%
	88.61%	91.64%	92.21%	90.97%
Maximum inrush current	35 A <sub cycle duration			
Maximum Heat Output	8525 BTU			
Maximum hold up time	12 ms			
Power supply output voltage	12 VDC			
Input Connector	IEC320 C20			

For configuration specific power specifications, use the Cisco UCS Power Calculator:

http://www.cisco.com/assets/cdc_content_elements/flash/dataCenter/cisco_ucs_power_calculator/

Figure 11. Input connectors for the UCS 5108 Chassis

Chassis inlet connector



IEC 320 C20

Cable connector for UCS 5108 Chassis



Environmental Specifications

Table 4. Environmental Specifications for the Cisco UCS 5108 Blade Server Chassis

Environment	Specification
Temperature operating	10°C to 35°C (50°F to 95°F)
Temperature nonoperating	-40°C to 65°C (-40°F to 149°F)
Altitude operating	0 to 3,000 m (0 to 10,000 ft.); maximum ambient temperature decreases by 1° per 300m
Humidity nonoperating	5 to 93%, non condensing
Vibration nonoperating	2.2 Grms, 10 minutes per axis on each of the three axes
Shock operating	Half-sine 2 G, 11 ms pulse, 100 pulses in each direction, on each of the three axes
Shock nonoperating	Trapezoidal, 25 G, two drops on each of six faces ΔV : 175 inches per second ec on bottom face drop, 90 inches per second ec on other five faces
Safety	UL60 950-1 No. 21CFR1040, CAN/CSA-C22.2 No. 60950-1, IRAM IEC60950-1, CB IEC60950-1, EN 60950-1, IEC 60950-1, GOST IEC60950-1, SABS/CB IEC6095-1, CCC*/CB GB4943-1995, CNS14336, CB IEC60950-1, AS/NZS 60950-1, GB4943
Emissions	47CFR Part 15 (CFR 47) Class A, AS/NZS CISPR22 Class A, CISPR2 2 Class A, EN55022 Class A, ICES003 Class A, VCCI Class A, EN61000-3-2, EN61000-3-3, KN22 Class A, CNS13438 Class A
Immunity	Verified to comply with EN55024, CISPR 24, KN 61000-4 Series, KN 24
Electrostatic discharge	Tested to ESD levels up to 15 kilovolts (kV) air discharge and up to 8 kV contact discharge without physical damage
Acoustic	<ul style="list-style-type: none">• Sound power: 54.7 dBA (5.7 Bels) at ambient temperature 23° C measured using the Dome Method• GOST MsanPIN 001-96

For More Information

Please visit <http://www.cisco.com/go/ucs>.



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Datasheet

NetApp FAS8200 Hybrid Flash System

Quickly respond to changing storage needs across flash, disk, and cloud with industry-leading data management

Key Benefits

Simplify Your Storage Environment

Run SAN and NAS workloads with unified scale-out storage.

Accelerate Enterprise Applications

Reduce latency and speed operations with up to 50% higher performance than that of previous generation.

Maximize Uptime

Eliminate planned downtime to add, upgrade, or retire storage with no disruptions.

Consolidate Infrastructure

Scale up to 57PB, cluster with AFF all-flash systems, and integrate existing third-party storage arrays.

Optimize for the Hybrid Cloud

Easily implement a service-oriented IT architecture with leading cloud integration.

The Challenge

Enabling the data-driven business

As the role of technology has expanded to cover key business operations as well as back-office functions, IT leaders have had to rethink the way they architect storage. Traditional requirements such as storage uptime, scalability, and cost efficiency are still critical, but so are factors such as flash acceleration, cloud integration, unified support for SAN and NAS, and simplified data mining for competitive advantage.

Many enterprises struggle, held back by structural limitations in legacy storage and data architectures. Traditional storage arrays might deliver on basic needs, but are divided into separate silos or are incapable of meeting advanced service requirements and leveraging the cloud.

The Solution

Accelerate business operations with unified scale-out storage

The demands of a data-driven business require a new approach to storage with an integrated combination of high-performance hardware; leading cloud connectivity; and adaptive, scalable storage software. It needs to support existing workloads as well as adapt and scale quickly to address new applications and evolving IT models.

FAS8200 hybrid storage systems are engineered specifically to address these needs. Powered by NetApp® ONTAP® data management software, the FAS8200 unifies your SAN and NAS storage infrastructure. When FAS8200 systems are clustered with NetApp AFF all-flash arrays and integrated with the cloud, you have the control to easily move your data to where it's needed for your business and place it in the storage environment that delivers the best combination of flash performance, storage capacity, and cost efficiency. With proven agility and data management capabilities, the FAS8200 has the flexibility to keep up with changing business needs while delivering on core IT requirements.

Unlock the power of flash

Flash-accelerated FAS8200 hybrid storage systems deliver up to 50% more performance than our previous generation FAS storage, boosting throughput, lowering latency, and meeting stringent service levels. The base configuration of each HA pair includes 2TB of onboard Flash Cache™ based on NVMe technology, which can be expanded up to 4TB of integrated Flash Cache and up to 72TB of total flash per HA pair when leveraging Flash Pool™ intelligent data caching. Hot data is automatically promoted to flash in real time, so you get the full benefit of flash performance.

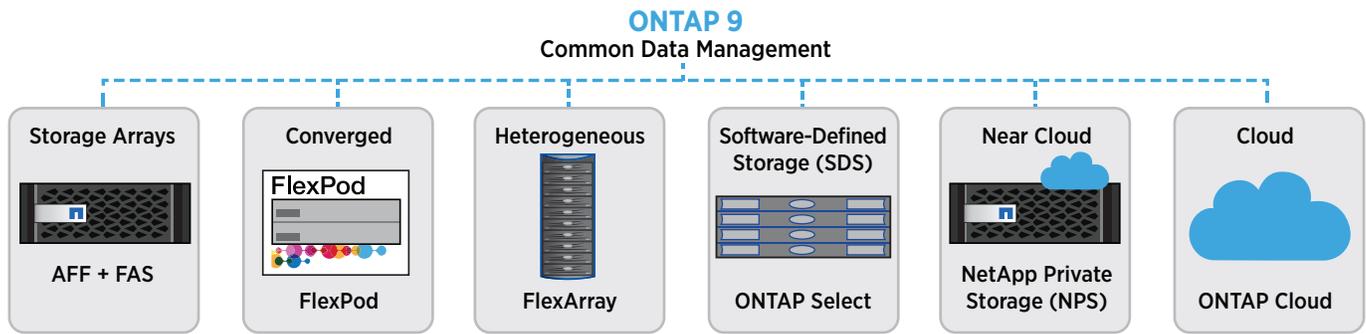


Figure 1) Standardize data management across architectures with a rich set of enterprise data services.

Scale and adapt to meet changing needs

Optimize and accelerate your storage environment as performance and capacity requirements change. Scale up by adding capacity, adding more flash acceleration, and upgrading controllers. Scale out by growing from 2 nodes up to a 24-node cluster with 57PB of capacity, including combinations of different FAS and AFF models.

FAS8200 systems also support massive NAS containers, which are easy to manage. With the NetApp FlexGroup feature of ONTAP 9, a single namespace can grow to 20PB and 400 billion files while maintaining consistent high performance and resiliency.

With nondisruptive addition and replacement of storage systems and components, scaling occurs without maintenance windows or the challenge of coordinating downtime across teams. Perform your updates during regular work hours.

Achieve unparalleled availability and nondisruptive operations

FAS8200 enterprise storage is engineered to meet demanding availability requirements. All models are designed to deliver 99.9999% availability or greater through a comprehensive approach that combines highly reliable hardware, innovative software, and sophisticated service analytics.

Software and firmware updates, hardware repair and replacement, load balancing, and tech refresh happen without planned downtime. Plus, NetApp Integrated Data Protection technologies protect your data, accelerate recovery, and integrate with leading backup applications for easier management.

Optimize your data infrastructure with the cloud-based predictive analytics and proactive support of NetApp Active IQ®. Prevent problems, save time, and gain insight by leveraging machine learning to get real-time predictions and recommendations based on community wisdom from NetApp's massive user base.

NetApp MetroCluster™ expands data protection to eliminate risk of data loss by synchronously mirroring data between locations for continuous availability of information. A MetroCluster storage array can exist in a single data center or in two different data centers that are located across a campus, across a metropolitan area, or in different cities. No matter what happens, your data can be protected from loss and is continuously available to meet the most business-critical needs. Plus, MetroCluster solutions

based on the FAS8200 offer enhanced configuration flexibility from the new controller architecture, which moves Flash Cache intelligent data caching from the PCIe slots to the motherboard and adds FCVI connectivity to the onboard UTA2 ports.

Get more from existing storage array investments

Simplify your IT operations and deliver more value from existing third-party arrays by using them as additional storage capacity behind FAS8200 systems. FlexArray® virtualization software running on the FAS8200 extends ONTAP to include storage capacity from EMC, Hitachi, HPE, IBM, and NetApp E-Series arrays. Consolidate management of your existing storage to increase efficiency, add support for SAN and NAS workloads, and provide superior data management functionality.

Optimize hybrid cloud deployment

Organizations today are focusing on service-oriented IT architectures where cloud IT models are leveraged to enhance return on investment and assets. The FAS8200 running ONTAP is optimized for private and hybrid cloud with secure multitenancy, adaptive quality of service (QoS), nondisruptive operations, and easily defined tiers of service.

Easily burst analytics and DevOps workloads to the cloud by connecting your FAS8200 to NetApp Cloud Volumes, the first enterprise-class native file service available in major hyperscalers.

For advanced data services that are common between your on-premises and cloud environments, leverage ONTAP Cloud, a version of ONTAP software that runs in Amazon Web Services (AWS) and Azure. Providing the storage efficiency, availability, and scalability of ONTAP, it allows easy movement of data between your on-premises FAS8200 and AWS or Azure environment with NetApp SnapMirror® data replication software.

For organizations that need an enterprise-class hybrid cloud with data governance and security, the FAS8200 can be used in a NetApp Private Storage (NPS) for Cloud solution. With NPS for Cloud, you can directly connect to multiple clouds using a private, high-bandwidth, low-latency connection. Connect to industry-leading clouds such as AWS, Microsoft Azure, or IBM Cloud and switch between them at any time, all while maintaining complete control of your data on your dedicated, private FAS8200.

Build the right long-term platform

When it comes to long-term storage infrastructure investments, it is critical to focus on flexibility for adapting to future requirements, simplification of your storage environment, and total cost of ownership. The FAS8200 provides a significant price-performance benefit. Plus it delivers industry-leading storage efficiency technologies such as inline deduplication, inline compression, inline compaction, thin provisioning, and space-efficient Snapshot™ copies to reduce your cost per effective gigabyte of storage.

It is also critical to look at the security of your data environment. With the NetApp Volume Encryption feature of ONTAP, you can easily and efficiently protect your at-rest data by encrypting any volume on FAS (and AFF) systems. No special encrypting disks required. Plus, optional external key management can further increase security.

In a data-driven business, you also need the ability to leverage data for competitive advantage and to assign resources dynamically for more effective operations. The NetApp OnCommand® suite of management and optimization software is composed of a range of products for use with the FAS8200, including automation, integration, device-level management, and enterprise storage resource management.

Table 1) FAS8200 technical specifications

Scale-Out	
	FAS8200
NAS Scale-Out: 1-24 Nodes (12 HA Pairs)	
Maximum drives (HDD/SSD)	5,760/2,880
Maximum raw capacity	57PB
Maximum onboard Flash Cache based on NVMe technology	48TB
Maximum Flash Pool	864TB
Maximum memory	3072GB
SAN Scale-Out: 1-12 Nodes (6 HA Pairs)	
Maximum drives (HDD/SSD)	2,880/1,440
Maximum raw capacity	28PB
Maximum onboard Flash Cache based on NVMe technology	24TB
Maximum Flash Pool	288TB
Maximum memory	1536GB
Cluster interconnect	2 10GbE

Get It Right from the Start Using NetApp Expertise

Whether you're planning your next-generation data center, need specialized know-how for a hybrid cloud environment, or want to optimize the operational efficiency of your existing infrastructure, we have the expertise. NetApp Services and our certified partners can help you navigate your digital transformation to successfully create, deliver, and consume data services that power your business. [Learn more at netapp.com/services](https://netapp.com/services).

About NetApp

NetApp is the data authority for hybrid cloud. We provide a full range of hybrid cloud data services that simplify management of applications and data across cloud and on-premises environments to accelerate digital transformation. Together with our partners, we empower global organizations to unleash the full potential of their data to expand customer touchpoints, foster greater innovation and optimize their operations. For more information, visit www.netapp.com. #DataDriven

Per HA Pair Specifications (Active-Active Dual Controller)	
	FAS8200
Maximum drives (HDD/SSD)	480/480
Maximum raw capacity	4800TB
Maximum onboard Flash Cache based on NVMe technology	4TB
Maximum Flash Pool	72TB
Controller form factor	3U
ECC memory	256GB
NVRAM	16GB
PCIe expansion slots	4
Onboard I/O: UTA 2 (8Gb/16Gb FC, GbE/10GbE, or FCVI ports [MetroCluster only])	8
Onboard I/O: 10GbE	4
Onboard I/O: 10GbE Base-T	4
Onboard I/O: 12Gb SAS	8
OS Version: ONTAP 9.1 RC1 and Later	
Shelves and media	See the Shelves and Media page1 on NetApp.com for the most current information.
Storage protocols supported	FC, FCoE, iSCSI, NFS, pNFS, CIFS/SMB
Host/client operating systems supported	Windows 2000, Windows Server 2003, Windows Server 2008, Windows Server 2012, Windows Server 2016, Windows XP, Linux, Sun Solaris, AIX, HP-UX, Mac OS, VMware, ESX

1. netapp.com/us/products/storage-systems/disk-shelves-and-storage-media/index.aspx.

Table 2) NetApp FAS8200 series software

	<p>The ONTAP 9 Base Bundle includes a set of software products that deliver leading data management, storage efficiency, data protection, and high performance. The optional Premium Bundle and extended value software products provide advanced capabilities, including instant cloning, data replication, application-aware backup and recovery, volume encryption, and data retention.</p>
<p>Software included in ONTAP 9 Base Bundle</p>	<p>The Base Bundle includes the following NetApp technologies:</p> <ul style="list-style-type: none">• Storage protocols: all supported data protocol licenses (FC, FCoE, iSCSI, NFS, pNFS, CIFS/SMB)• Efficiency: NetApp FlexVol®, deduplication, compression, compaction, and thin provisioning• Availability: multipath I/O• Data protection: RAID-TEC™, RAID DP®, and Snapshot• Performance: adaptive QoS• Scalable NAS container: FlexGroup• Management: OnCommand System Manager and OnCommand Unified Manager
<p>Software included in ONTAP 9 Premium Bundle (optional)</p>	<p>To add capabilities to the Base Bundle, the optional Premium Bundle includes the following NetApp technologies:</p> <ul style="list-style-type: none">• FlexClone®: instant virtual copies with file and volume granularity• SnapMirror®: integrated data replication technology for simple, efficient, flexible disaster recovery and backup use cases• SnapRestore®: restore entire Snapshot copies in seconds• SnapCenter®: unified, scalable software and plug-in suite for application-consistent data protection and clone management• SnapManager® suite: application- and virtual machine-aware backup and cloning <p>See NetApp.com for information about additional software available from NetApp.</p>
<p>Extended value software (optional)</p>	<p>Separate optional software, beyond the Base Bundle and Premium Bundle, is also available:</p> <ul style="list-style-type: none">• OnCommand Insight: infrastructure analytics platform that provides optimization, troubleshooting, monitoring, and cost analysis of your IT infrastructure• SnapLock®: compliance software for write once, read many (WORM)-protected file data• Volume Encryption: granular, volume-level data-at-rest encryption• FlexArray: virtualization of existing third-party storage arrays into an ONTAP environment to leverage the array storage capacity behind a NetApp FAS