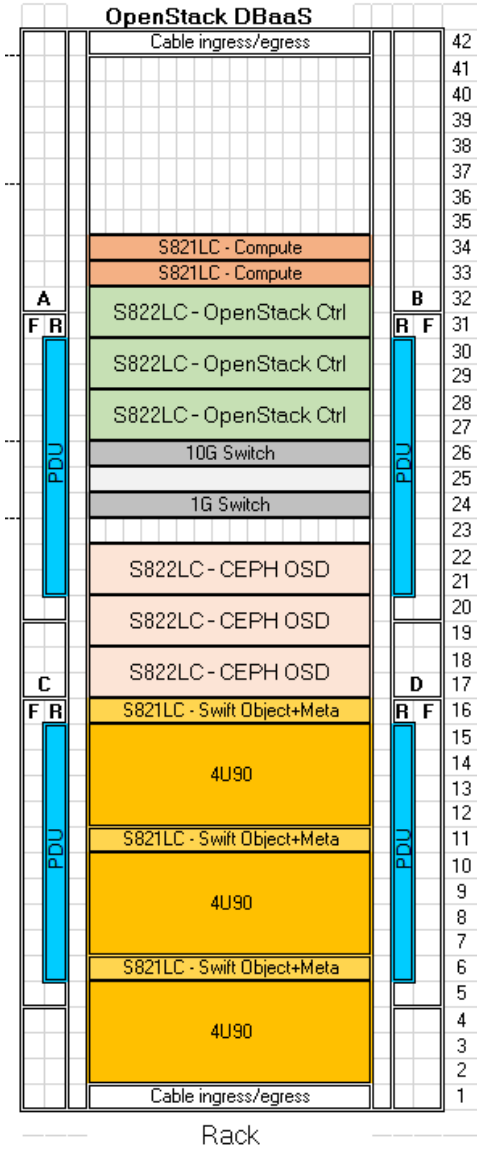
DBaaS– Base Config– High Level Specification Sheet



OpenStack Software Stack:
Ubuntu 16.04 (all nodes)
Openstack Newton

OpsMgr + Horizon DashBoard
-Nagios Core
- ELK Stack (Elasticsearch, Logstash, Kibana)

OpenStack Controller and Proxy:
QTY: 3

Server Config: (Briggs 8001-22C) (2U)
20 Cores (2.92 Ghz), 128 GB,
2 x 4TB SATA HDDs
1 x 2-Port 10G NIC (Intel 10G/Mellanox)

OpenStack Compute:
QTY: 2

Server Config: (Stratton 8001-12C) (1U)
16 Cores (2.3Ghz), 128GB ,
2 x 4TB SATA HDDs
1 x 2-Port 10G NIC (Intel 10G/Mellanox)

CEPH Config :
QTY: 3

Per Server Config: (Briggs 8001-22C) (2U)
16 Cores (3.32Ghz), 128GB
- (OS) 2x 128GB DOM + (Journal) 2x SSD 240GB (**1.2** DWPD) + (Storage) 10 x 8TB SAS HDDs (~80TB)
- 1 x 2-Port 10G NIC (Intel/Mellanox)

Swift Object / Metadata
QTY: 3

Per Server Config: (Stratton 8001-12C) (1U)
16 Cores (2.3Ghz), 256GB
- (OS) 2x 128GB DOM + 4 x SSDs 240GB
- 1 x 2-Port 10G NIC (Intel/Mellanox)
- 1 x LSI 3008 External SAS (8 port SAS3)

Expansion Drawer (4U) :
90 LFF JBOD Storage SMC PN SE-946ED-R2KJBOD
90 LFF – 2 TB SAS HDDs

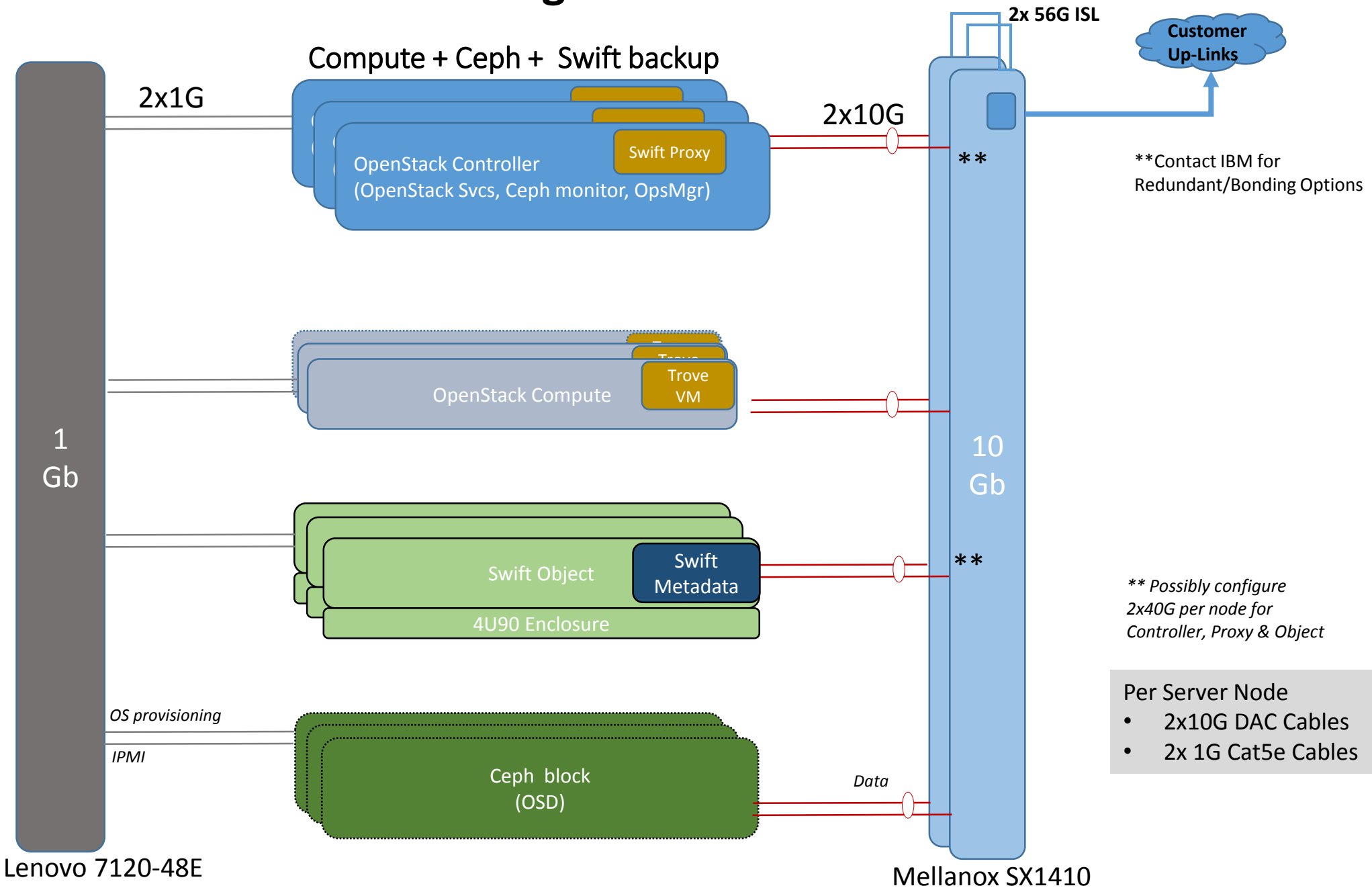
Network : (non HA) – no Bonding **
1 x Mellanox SX1410 (8831-S48)
1 x Lenovo G8052 (7120-48E)

Rack:
QTY: 1
SlimRack 7965-94Y (Standard 19" rack)
PDUs x 4: Each node should have 2 power cords cabled to two different PDUs

**Contact IBM for Redundant/Bonding Options

****Notes:**
a) Openstack & Proxy Node can be combined for fewer than 24 SWIFT Objects
b) Compute qty + Memory may need to be altered based on actual performance requirement
c) Dedicated Swift Proxy Server maybe required

High Level Network Architecture Diagram



Suggested Racking Rule

Suggested Racking Rule

Reserved for accessibility

Reserved **U37-U41** for **Rack-Rack** Switches
if ordered

Reserved **U24-U26** for **In-rack** Network Switches

Start at U2and go UP

Common Rule:

–Place Pod / same MTM / Similar Function together

–Place Heavier MTM first starting U2

–Follow native MTM unique racking requirement

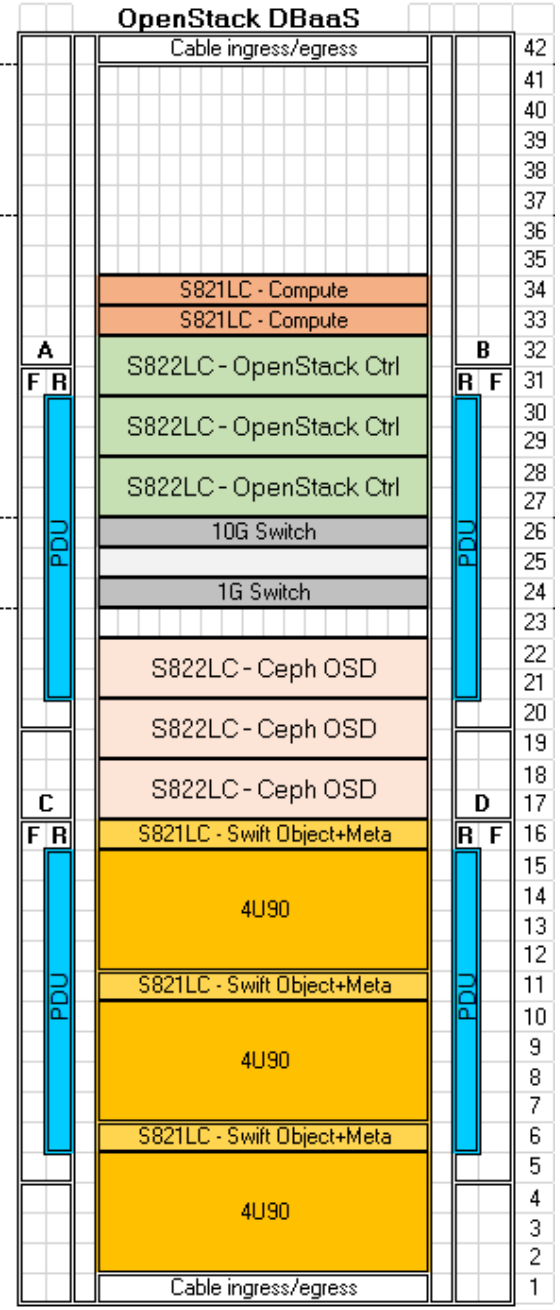
DBaaS Racking Rules:

– Recommend (0 -18) 2U Servers per Rack

– Ceph OSD and Swift Object nodes are placed in the lower part of the rack

– OpenStack controller and compute follow

Reserved for accessibility



Rack

Swift Proxy and OpenStack Controller BOMs

	MT	Model	Description	Mfg Config #1	Min	Max	Comments
S822C Server Config : Swift Proxy and OpenStack controller							
	8001	22C	ServerConfig- S822C	3	3	**	This section Defined the **Common config of the Server node** (in group servers) -- **Next Section :** Defined any unique config that you may need (Optional)
		Processor	EKP5 10-core POWER8 2.92 GHz	2	1	2	
		Memory	EKM2 (PS) 16GB DDR4 MEMORY DIMM	8	4	16	
		Bezel	EKB5 (PS) 2S BRIGGS LFF DIRECT ATTACH FAB ASSEMBLY	1	1	1	Need to Choose drive assemply to match your Disks (LFF/SFF) and Controler type (SAS)
		Storage Adapter	Integrated Sata controller	1	1	1	Build-in HDDs : Integrate SATA controller + Optional SAS /RAID Controller
				0	0	1	Optional - Exteral SAS adapter for Expansion SAS drawer
		Disks	EKDB 4TB 3.5" SATA HDD	2	0	2	OS Boot Disk
				0	0	4	If SAS drive is selected, please choose Bezel Assembly to match drive size (.5"
		NVmE PCI		0	4	2	
		GPU		0	0	1	
S822C Server (Base config) -- Required Inter-connect							
Required for Mfg Genesis		Network Adapter	EKA2 (PS) INTEL 82599ES 2-PORT SFP+ 10G GEN2 x8 STANDARD	1	1	3	**(Required) For High Speed Network**
				0	0	3	Section IO device (optional)
		Power	EKLJ (PS #6665) PWR CBL DRWR TO IBM PDU, 2.8m (9.2ft), 250V/10A, IEC320/C13, IEC320/C20	2	2	2	Select Proper Line cord if not connected to IBM PDU
		Cables	CAT5E SWITCH CABLE, BLUE (2M)	1	1	*	**(Required) For OS 1G Network (Recommended 2M length min)**
			CAT5E SWITCH CABLE, GREEN (2M)	1	1	*	**(Required) For IPMI 1G Network (Recommended 2M length min)**
			EKC1 3M- Active Twinax cable	2	2	*	**(Required) For High Speed Network (Recommended 2M length min)**
		Misc	Country specific FCs (keyboards, language groups) are selectable	1	1	1	User select
			Shipping and Handling	1	1	1	User select

OpenStack Compute Server BOMs

	MT	Model	Description	Mfg Config #1	Min	Max	Comments
S812C Server Config: OpenStack Compute							
	8001	12C	S821LC (8001)	**2**	**1**	**	
		Solution ID	Solution Specify Code (for grouping only)	1	1	1	n/a
		Pod Type	Login Server Specify Code	1	1	1	n/a
		Processor	8-core POWER8 2.328 GHz	2	1	2	
		Memory	EKM2 (PS) 16GB DDR4 MEMORY DIMM	8	4	16	
		Bezel	EKB4 2S base system with LFF high-function drive midplane (NVMe d	1	1	1	
		Storage Adapter	Integrated Sata controller	1	1	1	Build-in HDDs : Integrate SATA controller + Optional SAS /RAID Controller
				0	0	1	Optional - Exteral SAS adapter for Expansion SAS drawer
		Disks	EKDB 4TB 3.5" SATA HDD	2	0	2	OS Boot Disk
				0	0	4	If SAS drive is selected, please choose Bezel Assembly to match drive size (.5"
		NVmE PCI		0	4	2	
		GPU		0	0	1	
S812C Server (Base config) -- Required Inter-connect							
Required for Mfg Genesis		Network Adapter	EKA2 PCIe3 2-port 10 GbE SFP+ Adapter, based on Intel XL710	1	1	3	**(Required) For High Speed Network**
				0	0	3	Section IO device (optional)
		Power	EKLJ (PS #6665) PWR CBL DRWR TO IBM PDU, 2.8m (9.2ft), 250V/10A, IEC320/C13, IEC320/C20	2	2	2	Select Proper Line cord if not connected to IBM PDU
		Cables	CAT5E SWITCH CABLE, BLUE (2M)	1	1	*	**(Required) For OS 1G Network (Recommended 2M length min)**
			CAT5E SWITCH CABLE, GREEN (2M)	1	1	*	**(Required) For IPMI 1G Network (Recommended 2M length min)**
			EKC1 3M- Active Twinax cable	2	2	*	**(Required) For High Speed Network (Recommended 2M length min)**
		Misc	No rack integration	1	1	1	
			Country specific FCs (keyboards, language groups) are selectable	1	1	1	User select
			Shipping and Handling	1	1	1	User select

Ceph OSD Server BOMs

	MT	Model	Description	Mfg Config #1	Min	Max	Comments
S822C Server Config : Ceph OSD							
	8001	22C	ServerConfig- S822C	3	3	**	This section Defined the **Common config of the Server node** (in group servers) -- **Next Section :** Defined any unique config that you may need (Optional)
		Processor	EKP4 8-core POWER8 3.32 GHz	2	1	2	
		Memory	EKM2 (PS) 16GB DDR4 MEMORY DIMM	8	4	16	
		Bezel	EKB5 (PS) 2S BRIGGS LFF DIRECT ATTACH FAB ASSEMBLY	1	1	1	Need to Choose drive assemply to match your Disks (LFF/SFF) and Controler type (SAS)
		Storage Adapter	Integrated Sata controller	1	1	1	Build-in HDDs : Integrate SATA controller + Optional SAS /RAID Controller
				0	0	1	Optional - Exteral SAS adapter for Expansion SAS drawer
		Disks	EKSK 128 GB SATA Disk on module SuperDOM	2	0	2	OS Boot Disk
			EKS1 240 GB, SFF SATA SSD; 1.2 Disk Writes Per Day (DWPD) kit	2	0	4	If SAS drive is selected, please choose Bezel Assembly to match drive size (.5"
			EKDD 8TB 3.5" SATA HDD	10	0	4	If SAS drive is selected, please choose Bezel Assembly to match drive size (.5"
		NVmE PCI		0	4	2	
		GPU		0	0	1	
S822C Server (Base config) -- Required Inter-connect							
Required for Mfg Genesis		Network Adapter	EKA2 (PS) INTEL 82599ES 2-PORT SFP+ 10G GEN2 x8 STANDARD	1	1	3	**(Required) For High Speed Network**
				0	0	3	Section IO device (optional)
		Power	EKLJ (PS #6665) PWR CBL DRWR TO IBM PDU, 2.8m (9.2ft), 250V/10A, IEC320/C13, IEC320/C20	2	2	2	Select Proper Line cord if not connected to IBM PDU
		Cables	CAT5E SWITCH CABLE, BLUE (2M)	1	1	*	**(Required) For OS 1G Network (Recommended 2M length min)**
			CAT5E SWITCH CABLE, GREEN (2M)	1	1	*	**(Required) For IPMI 1G Network (Recommended 2M length min)**
			EKC1 3M- Active Twinax cable	2	2	*	**(Required) For High Speed Network (Recommended 2M length min)**
		Misc	Country specific FCs (keyboards, language groups) are selectable	1	1	1	User select
			Shipping and Handling	1	1	1	User select

Swift Object and Metadata Server BOMs

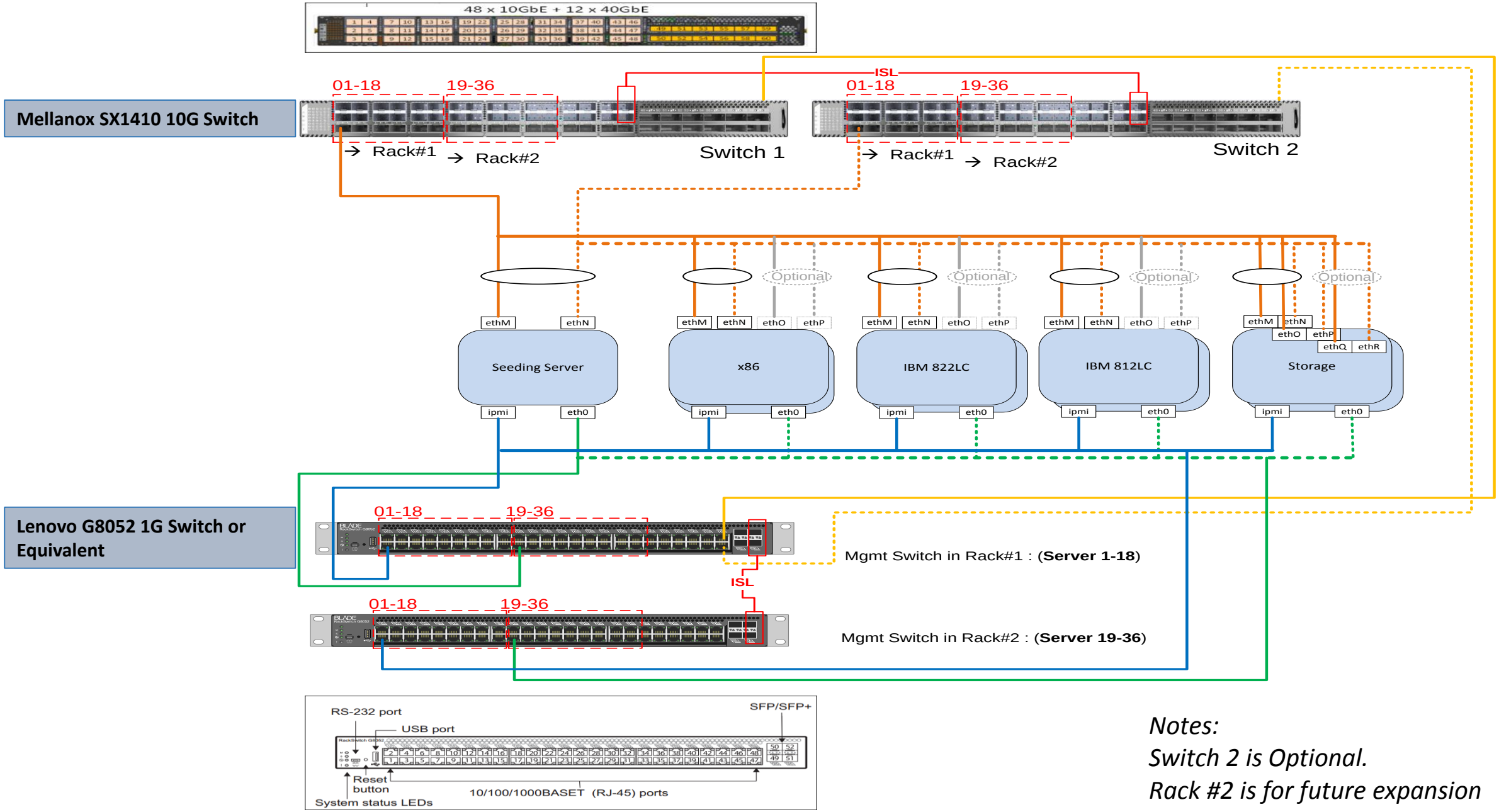
	MT	Model	Description	Mfg Config #1	Min	Max	Comments
S812C Server Config: Swift Object / Metadata							
	8001	12C	S821LC (8001)	**3**	**3**	**	
		Solution ID	Solution Specify Code (for grouping only)	1	1	1	n/a
		Pod Type	Login Server Specify Code	1	1	1	n/a
		Processor	8-core POWER8 2.328 GHz	2	1	2	
		Memory	EKM2 (PS) 16GB DDR4 MEMORY DIMM	16	4	16	
		Bezel	EKB4 2S base system with LFF high-function drive midplane (NVMe d	1	1	1	
		Storage Adapter	Integrated Sata controller	1	1	1	Build-in HDDs : Integrate SATA controller + Optional SAS /RAID Controller
			EKAD Storage Adapter SAS-3 3008 Chipset 8 Ports external for 1U	1	0	1	Optional - Exteral SAS adapter for Expansion SAS drawer
		Disks	EKSK 128 GB SATA Disk on module SuperDOM	2	0	2	OS Boot Disk
			EKS1 240 GB, SFF SATA SSD; 1.2 Disk Writes Per Day (DWPD) kit	4	0	4	In the Swift Large configuration, these drives are only required on the metadata server. If SAS drive is selected, please choose Bezel Assembly to match drive size (.5" or 3.5" and SAS controller)
		NVmE PCI		0	4	2	
		GPU		0	0	1	
		HDD Drawer	90 LFF JBOD Storage 90 LFF – 2TB SAS HDDs	1	1	1	Supermicro CSE-946ED-R2KJBOD 4U Rackmount https://www.supermicro.com/products/chassis/4u/946/SC946ED-R2KJBOD
S812C Server (Base config) -- Required Inter-connect							
	Required for Mfg Genesis	Network Adapter	EKA2 PCIe3 2-port 10 GbE SFP+ Adapter, based on Intel XL710	1	1	3	**(Required) For High Speed Network**
				0	0	3	Section IO device (optional)
		Power	EKLJ (PS #6665) PWR CBL DRWR TO IBM PDU, 2.8m (9.2ft), 250V/10A, IEC320/C13, IEC320/C20	2	2	2	Select Proper Line cord if not connected to IBM PDU
		Cables	CAT5E SWITCH CABLE, BLUE (2M)	1	1	*	**(Required) For OS 1G Network (Recommended 2M length min)**
			CAT5E SWITCH CABLE, GREEN (2M)	1	1	*	**(Required) For IPMI 1G Network (Recommended 2M length min)**
			EKC1 3M- Active Twinax cable	2	2	*	**(Required) For High Speed Network (Recommended 2M length min)**
		Misc	No rack integration	1	1	1	
			Country specific FCs (keyboards, language groups) are selectable	1	1	1	User select
			Shipping and Handling	1	1	1	User select

Network Switch BOMs

	MT	Model	FC	Description	
1G Mgmt (Base)	7120	48E		Lenovo G8052 1GbE Switch (48x 10GbE ports + 4x 10GbE ports)	1
			1118	CAT5E SWITCH CABLE, 3M, YELLOW	1
			6577	PWR CBL, DRWR TO IBM PDU, MFG SEL LENGTH, 200-240V/10A, IEC320/C13, IEC320/C14	2
				Include all existing FCs; except FCs 0010, 0011, 0712, 0714, EGSx, EHKx, EHLA, 4649 (Rack Integration Services), and 0456 (Customer Specified Placement); do not include these FCs.	

10G Data Network	8831	S48		Mellanox 10GB Switch (48x10G + 12x40G)	1
			EDT6	1U AIR DUCT FOR S48	1
				Include all existing FCs; except FC 4649, FC 0456 (Customer Specified Placement) and ESC1 (Shipping & Handling), do not include these FCs	1

Network Plug Rule - Sample



Notes:
Switch 2 is Optional.
Rack #2 is for future expansion

Network Plug P2P Label -- Sample

Server PCI Slot Placement

8001-12C/22C Stratton/Briggs

	adapter	PCI slot	Port	Cabling
Primary NIC	10GbE	slot 3	T1	yes
			T2	yes
Optional NIC	10GbE	slot 4	T1	
			T2	
Mgmt-OS	1GbE	LOM	T1	yes
BMC	1GbE	LOM	impi	yes

Cable P2P Label for H_TOR

		10GbE	10GbE	1GbE	1GbE
		H_TOR_1		M_TOR_1	M_TOR_1
Server #	Name <opt>	P2P Data network Cable Label	P2P Data network Cable Label	P2P Mgmt RJ4-5 Cable Label	P2P IPMI RJ-45 Cable Label
1		1A/SVR1/slot 3/T1 <> H_TOR_1/Port1	1A/SVR1/slot 3/T2 <> H_TOR_1/Port19	1A/SVR1/LOM/T1 <> M_TOR_1/Port1	1A/SVR1/LOM/impi <> M_TOR_1/Port19
2		1A/SVR2/slot 3/T1 <> H_TOR_1/Port2	1A/SVR2/slot 3/T2 <> H_TOR_1/Port20	1A/SVR2/LOM/T1 <> M_TOR_1/Port2	1A/SVR2/LOM/impi <> M_TOR_1/Port20
3		1A/SVR3/slot 3/T1 <> H_TOR_1/Port3	1A/SVR3/slot 3/T2 <> H_TOR_1/Port21	1A/SVR3/LOM/T1 <> M_TOR_1/Port3	1A/SVR3/LOM/impi <> M_TOR_1/Port21
4		1A/SVR4/slot 3/T1 <> H_TOR_1/Port4	1A/SVR4/slot 3/T2 <> H_TOR_1/Port22	1A/SVR4/LOM/T1 <> M_TOR_1/Port4	1A/SVR4/LOM/impi <> M_TOR_1/Port22
5		1A/SVR5/slot 3/T1 <> H_TOR_1/Port5	1A/SVR5/slot 3/T2 <> H_TOR_1/Port23	1A/SVR5/LOM/T1 <> M_TOR_1/Port5	1A/SVR5/LOM/impi <> M_TOR_1/Port23
6		1A/SVR6/slot 3/T1 <> H_TOR_1/Port6	1A/SVR6/slot 3/T2 <> H_TOR_1/Port24	1A/SVR6/LOM/T1 <> M_TOR_1/Port6	1A/SVR6/LOM/impi <> M_TOR_1/Port24
7		1A/SVR7/slot 3/T1 <> H_TOR_1/Port7	1A/SVR7/slot 3/T2 <> H_TOR_1/Port25	1A/SVR7/LOM/T1 <> M_TOR_1/Port7	1A/SVR7/LOM/impi <> M_TOR_1/Port25
8		1A/SVR8/slot 3/T1 <> H_TOR_1/Port8	1A/SVR8/slot 3/T2 <> H_TOR_1/Port26	1A/SVR8/LOM/T1 <> M_TOR_1/Port8	1A/SVR8/LOM/impi <> M_TOR_1/Port26
9		1A/SVR9/slot 3/T1 <> H_TOR_1/Port9	1A/SVR9/slot 3/T2 <> H_TOR_1/Port27	1A/SVR9/LOM/T1 <> M_TOR_1/Port9	1A/SVR9/LOM/impi <> M_TOR_1/Port27
10		1A/SVR10/slot 3/T1 <> H_TOR_1/Port10	1A/SVR10/slot 3/T2 <> H_TOR_1/Port28	1A/SVR10/LOM/T1 <> M_TOR_1/Port10	1A/SVR10/LOM/impi <> M_TOR_1/Port28
11		1A/SVR11/slot 3/T1 <> H_TOR_1/Port11	1A/SVR11/slot 3/T2 <> H_TOR_1/Port29	1A/SVR11/LOM/T1 <> M_TOR_1/Port11	1A/SVR11/LOM/impi <> M_TOR_1/Port29
12		1A/SVR12/slot 3/T1 <> H_TOR_1/Port12	1A/SVR12/slot 3/T2 <> H_TOR_1/Port30	1A/SVR12/LOM/T1 <> M_TOR_1/Port12	1A/SVR12/LOM/impi <> M_TOR_1/Port30