# Ericsson Unicycle OVS-DPDK Validation HW, Networking and IP plan

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# Unicycle OVS-DPDK Validation Servers

Verification was based on a Build Server VM and four identical Dell 740XD servers for the Regional Controller and three Unicycle nodes.



## PowerEdge R740XD Server

#### Components

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### THORNER OF

- PowerEdge R740/R740XD Motherboard
- Intel Xeon Gold 6152 2.1G, 22C/44T, 10.4GT/s , 30M Cache, Turbo, HT (140W) DDR4-2666
- iDRAC Group Manager, Enabled 1 iDRAC, Legacy Password
- 1 Chassis with Up to 24 x 2.5 Hard Drives for 2CPU, GPU Capable Configuration
- 1 Riser Config 6, 5 x8, 3 x16 slots
- PowerEdge R740 Shipping Material
- 1 No Quick Sync
- 1 Performance Optimized
- 1 2666MT/s RDIMMs
- 12 32GB RDIMM 2666MT/s Dual Rank
- Intel Xeon Gold 6152 2.1G, 22C/44T, 10.4GT/s , 30M Cache, Turbo, HT (140W) DDR4-2666 1 1 iDRAC9,Enterprise
- 4 480GB SSD SATA Read Intensive 6Gbps 512 2.5in Hot-plug AG Drive, 1 DWPD, 876 TBW
- 6 2.4TB 10K RPM SAS 12Gbps 512e 2.5in Hot-plug Hard Drive
- 1 PERC H730P RAID Controller, 2GB NV Cache, Adapter, Low Profile
- 2 C13 to C14, PDU Style, 10 AMP, 6.5 Feet (2m), Power Cord
- 1 Dual, Hot-plug, Redundant Power Supply (1+1), 1100W
- 1 No Trusted Platform Module
- 1 Order Configuration Shipbox Label (Ship Date, Model, Processor Speed, HDD Size, RAM)
- 1 GPU Ready Configuration Cable Install Kit
- 1 PE R740XD Luggage Tag
- 1 Intel X710 Dual Port 10Gb Direct Attach, SFP+, Converged Network Adapter
- 2 Intel XXV710 Dual Port 25GbE SFP28 PCIe Adapter, Full Height
- Intel X710 DP 10Gb DA/SFP+, + I350 DP 1Gb Ethernet, Network Daughter Card 1
- 1 HS Install Kit.GPU Config.No cable
- 1 ReadyRails Sliding Rails Without Cable Management Arm
- 1 Unconfigured RAID
- 1 **OME** Server Configuration Management

#### Software

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- 1 6 Performance Fans for R740/740XD
- 1 Performance BIOS Settings
- 1 No Operating System
- No Systems Documentation, No OpenManage DVD Kit

## Unicycle OVS-DPDK Validation Networking

The diagram below shows an example physical and L2 connectivity, the IP subnet plan, host and iDRAC addressing scheme similar to that used in the validation.

The Unicycle deployment does not configure the networking subsystem thus the choice of switch subsystem components is not restricted to those shown and they can be replaced with devices offering equivalent functionality.



## Unicycle OVS-DPDK Validation IP/VLAN Plan

Below is an example of a detailed network and IP address plan similar to that used during validation.

NOTE: LAG groups always created or	2 ports of the SAME N	C card on compute, LA	I not split acro	is NIC ca	rd slots.								
2 x 10G NIC card not used													
NOTE: *Build Server is only used to c	reate the Regional Con	troller. Once the RC is	built the build s	erver ha	us no further ro'	le in the deployment of the Rove	r or Unic	ycle pods i	ind can be removed				
Note: ** The RC uses the LAG bonde	d interface on 7.1.1 an	17.2.1 to send Redfish	API calls to the	Rovera	ad Unicycle nor	des connected to the 'oob' netw	ork thus a	outing bet	ween the 'host' and	oob' networks is	required.		
Network name	Server	Network name	Compute HW	Present	NIC dot/eort	Portrate	LAG	MD	Subnet	Hest address	Network name	Note	Compute
'osb'	Build Server*	coh	(1777)	fam)	were white:	474	No	mative	Arry	10 51 34 164		Initially build server insues Badfish rails to setup 8C. Scheenuerb 8C insues Badfish rowmands to Bruar and Listoria podes. Build server VM's april Interface emission 10.51.14.154/17 and april 10.51.14.254/27 and april 10.51.14.254/27 for DHCP server	Build Server
	Pasional controller		abanda 19	Ver	amo	10	No	option		10.51.35.146	146 144 'oob'	Switch our coefficient as score and holdered to U AN 400 in switch parametric	Resident controller
	University (manager 1)		abaada 15		8140	10						terning per compared as access por Longardo as Tables do un annue recentered.	Helevale (menter?)
	University (masser a)		abrede 22	No.	0000				10.51.35.128/27	10.01.00.144		An text part compared as a costs por a magnetic or text work with a memory of	the levels frequencies
	Unicycle (peneso)	000	aunooe25	Tes	ONFC	10	NO	nauve		10.51.35.145		owner por compres as access port or rigger to YUAA would switch network	Unicycle [genesis]
No. of Concession, Name	Unicycle (mastera)	000	acheosal	TOI	USEC .	20	NO	native	6.000	10.51.35.147	No. of Concession, Name	Switch port computed as access port proged to VLAN HOU in switch network	Unicycle (mastera)
Networkhame	Server	networkhane	compotentw	resent	. Micsiot/port	Pertrace	UIG	NO	Secret	Host address	networkname	ing te	compute
	ECHOServer.	nost	(vm)	Tes	(vm)		NO	native		Isme L2 comsin	in 'host' (maybe seen as 'oam')	when keptonal controller minit booted it UHCP kequett it terved by Build Servert UHCP terver on ende	Build Server
	Regional controller	Post	aknode29	Yes	7.1.16.7.2.1	2x250	Yes	408	10.51.34.224/27	10.51.34.230		Kover/Unicycle15 [genesis node] DHCP Requests are served by Reponal Controller's DHCP servers. The KC also uses this phy interface for IDKAC management of the Rover and Unicycle nodes	Reponal controller
"host" (maybe seen as 'earn')	Unicycle (master2)	host	aknode25	Yes	21182.2.1	2x250	Yes	408		10.51.34.232			Unicycle [master2]
	Unicycle [genesis]	host	aknode23	Yes	21182.2.1	2x256	Yes	408		10.51.34.233		The genesis node sends its initial DHCP Requisithis interface to the RC	Unicycle [genesis]
	Unicycle (master3)	host	aknode31	Yes	2.1.1 8 2.2.1	2x250	Yes	408		10.51.34.229			Unicycle [master3]
Networkname	Server	Network name	Compute HW	Present	: NIC slot/port	: Port rate	LAG	ND	Subnet	Host address	Networkname	Note	Compute
	Regional controller	Network not present	NA	No	NA	NA	NA	NA				No 'pxe' network on RC. RC node pxe boots over 'host' network from Build Server	Regional controller
	Unicycle [master2]	pole	aknode25	Yes	eno3	first 1G port on integrated can	d No	native		10.224.168.11	Sec. 1	Unicycle [genesis] boots from RC over 'host' network over 'host' L2 network (over WAN). After setup Unicycle1 node support a MAAS server to boot other loca Unicycle nodes	Unicycle [master2]
	Unicycle (genesis)	pixe	aknode23	Yes	eno3	first 1G port on integrated can	s No	native	10.224.168.0/24	10 224 168 12		Unicycle (master/2) boots from local MAAS server on Unicycle1 node over 'pxe'L2 physical site local network	Unicycle (genesis)
	Unicycle [master3]	poxe	aknode31	Yes	eno3	first 16 port on integrated car-	d No	native		10.224.168.13		Unicycle [master3] boots from local MAAS server on Unicycle1 node over 'pre'L2 physical site local network	Unicycle [master3]
Networkname	Server	Networkname	Compute HW	Present	: NIC slot/port	Port rate	LAG	MD	Subnet	Host address	Networkname	Note	Compute
	Regional controller	Network not present	NA	No	NA	NA	NA	NA					Regional controller
"ksn" (maybe seen as 'calico')	Unicycle [master2]	kan	aknode25	Yes	21182.2.1	2x258	Yes	22		10 224 160 184	"ksn" (maybe seen as "calico")	Calico is used as the k8s CNL	Univerte (master?)
	Unicycle [genesis]	ksn	aknode23	Yes	2110221	2x259	Yes	22	10.224.160.0/24	10.224.160.135		Calico's BGP pod peering is to the TOR router based on eBGP peering	Unicycle (genesis)
	Unicycle (genesis) Unicycle (master3)	ksn kan	aknode23 aknode31	Yes Yes	2118221	2x250 2x250	Yes Yes	22 22	10.224.160.0/24	10.224.160.135 10.224.160.136		Callors BXP pod pering into the TOR router based on eRdP peering TOR noter regimes dynamic SBP peering configurations to accept each callor SBP speakers SSP peering request	Unicycle (genesis) Unicycle (master3)
Networkname	Unicycle [genesis] Unicycle [master3] Server	ksn kan Network name	aknode23 aknode31 Compute HW	Yes Yes Present	2.1.16.2.2.1 2.1.16.2.2.1 NIC slot/port	2x256 2x256 Port rate	Yes Yes LAG	22 22 VID	10.224.160.0/24 Subnet	10.224.160.135 10.224.160.136 Host address	Networkname	Calico's BOP pod peering is to the TOR-router based on eBOP peering TOR motime requires dynamic BOP peering configuration to accept each calico BOP speaker's BOP peering request None	Unicycle [genesis] Unicycle [master3] Compute
Networkname	Unicycle [genesis] Unicycle [master3] Server Regional controller	ksn kan Network name Network not present	aknode23 aknode31 Compute HW NA	Yes Yes Present No	2116221 2116221 NICslot/port NA	2x250 2x250 Port rate NA	Yes Yes LAG	22 22 VID NA	10.224.160.0/24 Subnet	10.224.160.135 10.224.160.136 Host address	Network name	Chilon 1989 pad parenty is to the TOR Income Hoade on eARD parenty TOR Income requires dynamic 807 parenty configurations to accept and charlos 807 speakers 807 parenty request. Note	Unicycle (genesis) Unicycle (master3) Compute Resignal controller
Network name	Unicycle (genesis) Unicycle (master3) Server Regional controller Unicycle (master2)	ksn kan Network name Network not present storage	aknode23 aknode31 Compute HW NA aknode25	Yes Yes Present No Yes	2116221 2116221 NIC slot/port NA 2116221	2x250 2x250 Port rate NA 2x250	Yes Yes LAG NA Yes	22 22 VID NA 23	10.224.160.0/24 Subnet	10.224.160.135 10.224.160.136 Host address 10.224.174.11	Network name	Carlon X R/D approxy to mit TO mony contraste or ell'P pering TO mone requires damant d'D' pering contraste assist exit h artics 300 pering request Rese	Unicycle (genesis) Unicycle (master3) Compute Regional controller Unicycle (master2)
Network name 'storage'	Unicycle [genesis] Unicycle [master3] Server Regional controller Unicycle [master2] Unicycle [senesis]	ksn kan Network name Network not present storage storage	aknode23 aknode31 Compute HW NA aknode25 aknode23	Yes Yes Present No Yes Yes	2116223 2116221 NIC slot/port NA 2116221 2116223	2x256 2x250 Portrate NA 2x256 2x250	Yes Yes LAG NA Yes Yes	22 22 VID NA 23 23	10.224.160.0/24 Subnet	10.224.160.135 10.224.160.136 Host address 10.224.174.11 10.224.174.12	Network name 'storage'	Chron Mey Appropried you that Chron Landow and Byering Mey Chron Hanges Annual Mey Barrey Carling Landow and Landow Shift yearing Shift yearin	Unicycle (prnesis) Unicycle (master3) Compute Regional controller Unicycle (master2) Unicycle (master2)
Network name 'storage'	Unicycle [genesis] Unicycle [master3] Server Regional controller Unicycle [master2] Unicycle [master3] Unicycle [master3]	kon kan Network name Network not present storage storage storage	aknode23 aknode31 Compute HW NA aknode25 aknode23 aknode31	Yes Yes Present No Yes Yes Yes	2116221 2116221 NIC slot/port NA 2116221 2116221 2116221	22256 22250 Portrate NA 22256 22256 22256	Yes Yes LAG NA Yes Yes Yes	22 22 VID NA 23 23 23	10.224.160.0/24 Subnet	10 224 160 135 10 224 160 136 Host address 10 224 174 11 10 224 174 12 10 224 174 13	Network name 'storage'	Carlon SAP Opperand is a the TSA Source Sand and AB penning Carlon SAP Service Sand And SAP service conference on the SAP service services New Same Same Same Same Same Same Same Same	Unicycle [genesis] Unicycle [master3] Compate Regional controller Unicycle [master2] Unicycle [genesis] Unicycle [master3]
Network name 'storage'	Unicycle (penesis) Unicycle (master3) Server Regional controller Unicycle (master2) Unicycle (penesis) Unicycle (master3) Server	kon kan Network name Network not present storage storage Network name	aknode23 aknode31 Compute HW NA aknode25 aknode23 aknode31 Compute HW	Yes Yes Present No Yes Yes Yes	2116223 2116223 NIC slot/port NA 2116223 2116223 2116223 2116223	2x256 2x250 Portrate NA 2x256 2x256 2x256 2x256 50rt rate	Yes Yes LAG NA Yes Yes LAG	22 22 WD NA 23 23 23 23	10.224.160.0/24 Subnet 10.224.174.0/24	10.224.160.135 10.224.160.136 Host address 10.224.174.11 10.224.174.12 10.224.174.13 Most address	Network name 'storage'	Carlon XR by parenty is the DNA more tasks on ABI penny Charlon Level and Annual ABI penny configuration to accept each table SDF penny request Annual tasks of the Sub-Carlon Carlon Ca	Unicycle [genesis] Unicycle [master3] Compute Regional controller Unicycle [master2] Unicycle [genesis] Unicycle [genesis] Compute
Network name 'storage' Network name	Unicycle (penesis) Unicycle (master3) Server Regional controller Unicycle (master2) Unicycle (penesis) Unicycle (master3) Server	ksn kan Network name Network not present storage storage Storage Network name	aknode23 aknode31 Compute HW NA aknode25 aknode23 aknode31 Compute HW	Yes Yes Present No Yes Yes Yes Present	211622.1 211622.1 NIC slot/port NA 211622.1 211622.1 211622.1 NIC slot/port	20256 20250 Portrate NA 20256 20256 20256 Portrate	Yes Yes LAG NA Yes Yes LAG	22 22 WD NA 23 23 23 23 23 WD	10.224.360.0/24 Subnet 10.224.374.0/24 Subnet	10.224.160.135 10.224.160.136 Host address 10.224.174.11 10.224.174.12 10.224.174.13 Host address	Network name 'storage' Network name	Chron MP optiering task the TO-Konon States and Byering Million annound service SP parenge understates and tasks SD parenge paper New The U-To-Conon States Statege network New	Unicycle (genesis) Unicycle (master3) Compate Regional controller Unicycle (master2) Unicycle (genesis) Unicycle (master3) Compate
Network name 'storage' Network name	Unicycle (penesis) Unicycle (master3) Server Regional controller Unicycle (master3) Unicycle (master3) Server	kon kan Network name Network not present storage storage Network name	aknode23 aknode31 Compute HW NA aknode25 aknode33 aknode31 Compute HW	Yes Yes Present No Yes Yes Present	211622.1 211622.1 NA 211622.1 211622.1 211622.1 211622.1 NICslot/port	NA 22256 Port rate NA 22256 22256 Port rate	Yes Yes LAG NA Yes Yes LAG	22 22 WD NA 23 23 23 23 WD	10.224.360.0/24 Subnet 10.224.374.0/24 Subnet	10.224.160.135 10.224.160.136 Host address 10.224.174.11 10.224.174.12 10.224.174.13 Host address	Network name 'storage' Network name	Carlos Mar Janaren et an Unitaria alta en al Mar Janaren Salt genreg Unitaria esperande alta esperange anglemente la solar sectorales 80° genreg reguese Mar Janaren et al especiales la regenerativa espectadore de la solar de la solar Solar de la solar de la solar Reserved de la solar de Reserve de la solar de	Unicycle (proesis) Unicycle (master3) Compute Regional controller Unicycle (master2) Unicycle (master3) Unicycle (master3) Compute Basiconal controller
Network name 'storage' Network name	Unicycle (pressis) Unicycle (master3) Server Regional controller Unicycle (master3) Unicycle (master3) Server Regional controller Unicycle (master3)	kon kan Network name Network not present storage storage Network not present	aknode23 aknode31 Compute HW NA aknode25 aknode23 aknode31 Compute HW NA aknode35	Yes Yes Present No Yes Yes Present No Yes	211822.1 211822.1 NIC slot/port NA 211822.1 211822.1 211822.1 NIC slot/port NA 211822.1	1 2256 Port rate NA 2256 2256 2256 2256 2256 2256 2256 225	Yes Yes LAG Yes Yes LAG NA	22 22 WD NA 23 23 23 23 WD NA 24	10.224.160.0/24 Subnet 10.224.174.0/24 Subnet	10 224 160 135 10 224 160 136 Host address 10 224 174 11 10 224 174 12 10 224 174 13 Host address	Network name 'storage' Network name	Carlon Me Appropring to the DNA concernation and a people DMI carlon any analysis of earlier SHP people configurations to assign each table SHP people people Table to Specification and people configurations to assign each table SHP people people configurations Table to Specification and people configurations to assign each table SHP people people configurations Table to Specification and people configurations to assign each table SHP people configurations Table to Specification and people configurations to assign each table SHP people configuration and table she she she she sho assign each table she she she she she sho assign each table she she she she she she she she she sh	Unicycie (genesis) Unicycie (masers) Compate Regional controller Unicycie (master2) Unicycie (master3) Compate Regional controller Ikinota (master3)
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Network name 'storage' Network name 'newtror' (maybe seen as 'overlay')	Unicycle (pressi) Server Regional controllee Unicycle (master2) Unicycle (master2) Unicycle (master2) Server Regional controllee Unicycle (master2) Unicycle (master2) Unicycle (master2) Unicycle (master2)	kon kan Network name Network not present storage storage Network not present neutron neutron neutron neutron	aknode23 aknode31 Compute HW NA aknode25 aknode23 aknode31 Compute HW NA aknode25 aknode25 aknode23 aknode31	Yes Yes Present No Yes Present No Yes Yes Yes	211822.1 211822.1 NLC stor/port NA 211822.1 211822.1 211822.1 211822.1 NLC stor/port NA 211822.1 211822.1 211822.1 211822.1 211822.1	1 2256 2259 Pertrate NA 2256 2256 2256 Pertrate NA 2256 2256 2256 2256	Yes Yes LAG NA Yes Yes LAG NA Yes Yes Yes	22 22 VID NA 23 23 23 VID NA 24 24 24	10.224.160.0/24 Subnet 10.224.174.0/24 Subnet 10.224.171.0/24	10.224.160.135 30.224.180.136 Host address 10.224.174.11 10.224.174.12 10.224.174.13 Most address 10.224.171.11 10.224.171.11 10.224.171.13	Network name 'storage' Network name 'seutron' (staylor seen as 'evenlay'	Cercity May Opplaneting to the DNA concertained on ABI pering DNA terr Report Answer SUP pering configurations to assign each table SUP genergy request. These Rese Res Res Res	Ukicycie (grnesic) Ukicycie (master3) Compute Magional controller Ukicycie (master2) Ukicycie (master2) Compute Regional controller Ukicycie (master2) Ukicycie (master2) Ukicycie (master3)
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## Unicycle OVS-DPDK BGP Plan

The three unicycle nodes automatically peer with an external fabric BGP speaker using eBGP. The calico nodes do not peer using an internal iBGP mesh. Below is and example similar to that used in the validation.

BGP						
	ASN	IP adddress/subnet	Start IP	End IP		
Calico ('k8s' network)	65531	10.224.160.0/24	10.224.160.134	10.224.160.254		
external router (maybe QFX or other HW/SW router TBD)	65001	10.224.160.129	NA	NA		Any prave AN other than the calica AN can be used. The external router must be on the annel is downan as the "kun" network but can be a physical router or a SW based router Dynamic IBGP peering to the calico subset must be configured on the external peer router to access DBP peering requests from any kBs. Calico BGP speaker The external IBGP configured and the external peer router to access DBP peering request from any kBs. Calico BGP speaker The external IBGP configured and the external SMP that the arr ensert external strates and the strates IBGP scenario.

In addition to the eBGP approach, limited validation was also performed using a full iBGP mesh between calico nodes without the need for an external BGP router. To change the deployment to BGP peer in this manner follow the notes shown in the example yaml file Example Configuration Input File - Unicycle Pods with OVS-DPDK Dataplane on Dell 740XD Servers.

## Unicycle OVS-DPDK LAG Details

The RC and Unicycle genesis nodes boot via VLAN tagged 'host' interface which is pre-provisioned on the QFX switches with LAG bonding. Since booting occurs before the linux kernel can bring up its LAC-P signalling the QFX switches must be configured to pass traffic on their primary (first) link before the LAG bundle is up.

Note the Unicycle [master2] and unicycle [master3] nodes do not boot over the 'host' network but rather over the edge site 'pxe' network which is a single link to each unicycle server and thus not lag bonded.

LAG config on QFX5200 FORCE UP DHCP and http pxe boot occurs over interfaces configured for LAG on JPR switches