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ISP Design – Using MikroTik CHR as a BGP edge router

PRESENTED BY:

KEVIN MYERS, NETWORK ARCHITECT

Profile: About Kevin Myers

Background:

- 19+ years in Networking
- Designed/Built Networks on 6 continents
- MikroTik Certified Trainer
- MikroTik, Cisco and Microsoft Certified



Community Involvement:



Packet Pushers (Podcast Guest / Blogger)



Group Contributor (RouterOS / WISP Talk and others)



Delegate/Roundtable contributor (NFD14)



MT Forum (Forum Veteran – Member since 2012)



Network Collective (Podcast Guest)

Profile: About IP ArchiTechs

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Call us at: +1 855-645-7684 E-mail: <u>consulting@iparchitechs.com</u> Web: <u>www.iparchitechs.com</u> **Goal of this presentation:** When the presentation is finished, hopefully you will have walked away with a few key concepts:

- Performance characteristics of the CHR on multiple hypervisors
- Best practices when deploying the CHR
- Benefits of using the CHR vs CCR as a BGP edge router



Design: CHR vs. CCR for full BGP tables?

- Which platform is better?
- Throughput capabilities?
- x86 CPU vs. Tilera?
- BGP Updates, Set BGP Attributes (Community, Localpref)



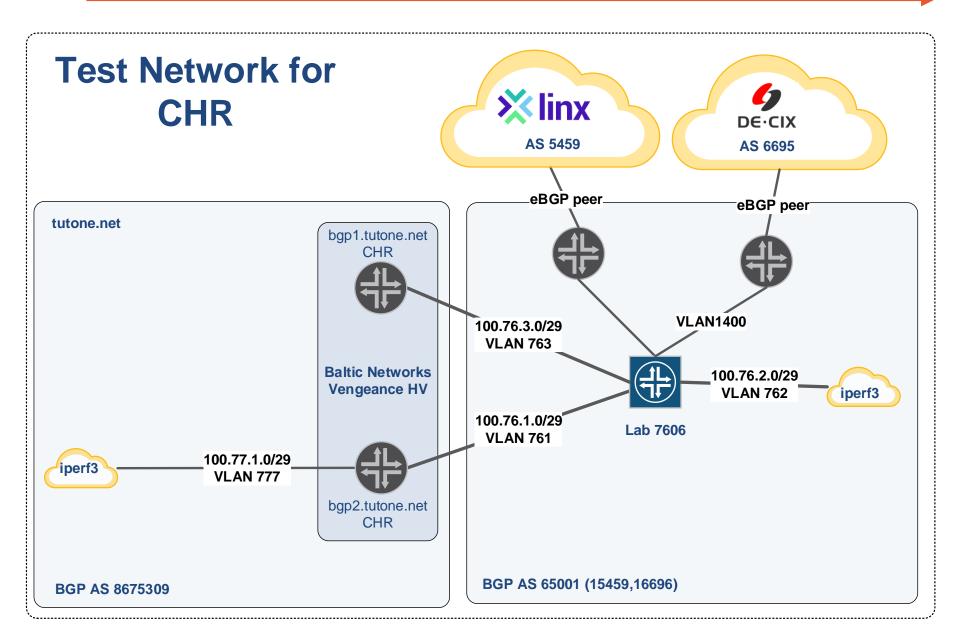




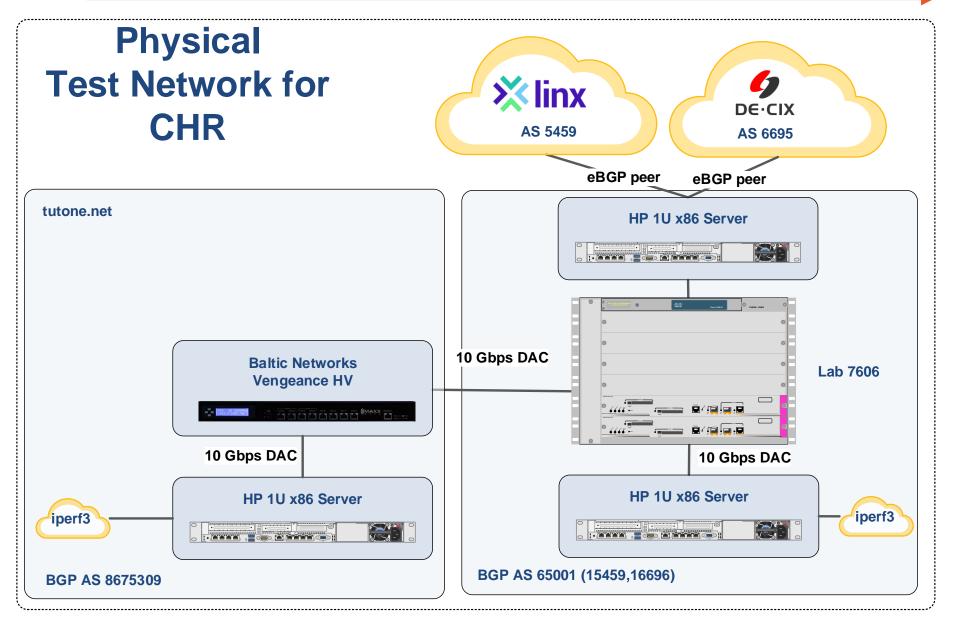
Design: CHR vs. CCR for full BGP tables?

Platform	Mikrotik	
CPU BGP routers with full tables have a high computational requirement.	x86 Better for heavy computational work. Higher power draw.	Tilera Optimized for packet transfer. Designed to be low power draw.
Throughput At 1500 bytes, 512 bytes and 64 bytes	x86 More CPU and power is required to move data at the same speed as a CCR	Tilera Handles throughput at different frame sizes slightly better than x86
Routing table size Impact of multiple tables	x86 Not limited by ASIC, x86 can process multiple tables more quickly than CCR if the HV host has a high clock speed CPU.	Tilera Not currently limited by ASIC. Limited to fixed speed single core performance











- Hypervisor details VM provisioning
- 8 vCPUs Total
 - Performance was better when using more sockets vs. more cores with a single socket
 - With BGP single core performance is critical. You need to use a CPU with the most powerful single core performance that you can afford for the hypervisor host.
- 4096 MB RAM

Design: CHR performance on VMWARE ESXi

Concept of testing

- Performance on 1 BGP full table
- Performance on 2 BGP full tables
- Performance at 1500 bytes, 512 bytes and 96 bytes
- Throughput performance with convergence test
- Performance settings
 - Sockets vs CPUs More sockets is better
 - TSO/LSO Disable for best performance
 - Clock speed Highest speed possible

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Platform	Hypervisor	CHR	
Baltic Vengeance	VM Ware ESXi 6.5	6.41.3	
DE-CIX March 2018 Routing Table: Time - 26 seconds			

BGP					
Instances VRFs Peers Netwo	rks Aggregates	VPN4 Route	s Advertise	ments	
+ - * × 🗆 🍸	Refresh Re	efresh All	Resend	Resend All	
Name 🗸	Remote Address	Remote AS	Uptime	Prefix Count	State
CIX (IPA-JXN-7606-01)	100.76.3.1	16695	00:00:26	680122	established
state the second	10.255.236.160	8675309			idle

Design: CHR performance on VMWARE ESXi (2 Full Tables)

IP

Platform	Hypervisor	CHR
Baltic Vengeance	VM Ware ESXi 6.5	6.41.3

DE-CIX and LINX March 2018 Routing Table: **Time – 4:46 seconds**

BGP						
Instances VRFs Peers Netv	works Aggregates	VPN4 Route	s Advertise	ements		
+ - 🗸 🗖 🍸	Refresh F	lefresh All	Resend	Resend All		
Name 🗡 R	Remote Address	Remote AS	Uptime	Prefix Co	State	
R LINX (IPA-JXN-7606-01)	00.76.1.1	65001	00:04:46	527926	established	
<pre></pre>	0.255.236.150	8675309	00:04:34	678597	established	
board	inBox v6.41.3 on C	HR (x86_64)				
0 (bgp2.tutone.net (ESXi)) - W board Session: 10.255.236.150	inBox v6.41.3 on C	HR (x86_64)				
board	inBox v6.41.3 on C	HR (x86_64)				
board Session: 10.255.236.150 BGP	in Box v6.41.3 on C vorks Aggregates	HR (x86_64) VPN4 Routes	s Advertise	ments		
board Session: 10.255.236.150 BGP	vorks Aggregates	VPN4 Routes	s Advertise Resend	ments Resend All]	
board Session: 10.255.236.150 BGP Instances VRFs Peers Netv	vorks Aggregates	VPN4 Routes			State	
board Session: 10.255.236.150 BGP Instances VRFs Peers Netw	vorks Aggregates	VPN4 Routes	Resend	Resend All Prefix Count	State	e

Design: CHR performance on VMWARE ESXi (1500 byte MTU)

Platform	Hypervisor	CHR
Baltic Vengeance	VM Ware ESXi 6.5	6.41.3

Throughput: 5.3 Gbps Peak VM CPU: 28%

Session: 10.255.236.160	D		CPU: 28% 📕 🛅
Interface <ether2></ether2>			
General Ethemet Loo	op Protect Status Traffic	1	ОК
Tx/Rx Rate:		/ <mark>5.3 Gbps</mark>	Cancel
Tx/Rx Packet Rate:	76 051 p/s	/ 438 428 p/s	Apply
FP Tx/Rx Rate:	0 bps	/ 0 bps	Disable
FP Tx/Rx Packet Rate:	0 p/s	/ 0 p/s	Comment
Tx/Rx Bytes:	35.0 GiB	/ 3937.0 GiB	Torch
Tx/Rx Packets:	559 158 356	/ 2795 529 962	Cable Test
Tx/Rx Drops:	0	/0	Blink
Tx/Rx Errors:	0	/0	Reset MAC Address
Tx/Rx Erors: 0 /0 Reset MAC Address Tx: 40.8 Mbps 40.9 Mbps 40.9 Mbps 40.9 Mbps Rx: 5.3 Gbps 40.9 Mbps 40.9 Mbps 40.9 Mbps Tx: 40.8 Mbps 40.9 Mbps 40.9 Mbps 40.9 Mbps Tx: 40.8 Mbps 40.9 Mbps 40.9 Mbps 40.9 Mbps Tx: 40.8 Mbps 40.9 Mbps 40.9 Mbps 40.9 Mbps Tx: 40.8 Mbps 40.9 Mbps 40.9 Mbps 40.9 Mbps Tx: 40.8 Mbps 40.9 Mbps 40.9 Mbps 40.9 Mbps Tx: 40.8 Mbps 40.9 Mbps 40.9 Mbps 40.9 Mbps Tx: 40.8 Mbps 40.9 Mbps 40.9 Mbps 40.9 Mbps Tx: 40.8 Mbps 40.9 Mbps 40.9 Mbps 40.9 Mbps Tx: 7.0 Mbps 40.9 Mbps 40.9 Mbps 40.9 Mbps Tx: 7.0 Mbps 40.9 Mbps 40.9 Mbps 40.9 Mbps Tx: 7.0 Mbps 40.9 Mbps 40.9 Mbps 40.9 Mbps Tx: 7.0 Mbps 40.9 Mbps 40.9 Mbps 40.9 Mbps			
Rx Packet: 438 42			

Design: CHR performance on VMWARE ESXi (512 byte MTU)

Platform	Hypervisor	CHR
Baltic Vengeance	VM Ware ESXi 6.5	6.41.3

Throughput: 3.0 Gbps Peak VM CPU: 38%

Session: 10.255.236.160	٥		CPU: 38% 📕 🕅
Interface <ether2></ether2>			
General Ethernet Loo	p Protect Status Traffic		ОК
Tx/Rx Rate:	49.1 Mbps	/ <mark>3.0 Gbps</mark>	Cancel
Tx/Rx Packet Rate:	90 859 p/s	/ 669 883 p/s	Apply
FP Tx/Rx Rate:	0 bps	/ 0 bps	
FP Tx/Rx Packet Rate:		/0p/s	Disable
			Comment
Tx/Rx Bytes:		/ 4207.0 GiB	Torch
Tx/Rx Packets:	609 492 425	/ 3092 913 865	Cable Test
Tx/Rx Drops:	0	/0	Blink
Tx/Rx Errors:	0	/0	Reset MAC Address
Tx: 49.1 Mbps			
Rx: 3.0 Gbps			
		a	
Tx Packet: 90 859	p/s		
Rx Packet: 669 88	3 p/s		

Design: CHR performance on VMWARE ESXi (96 byte MTU)

Platform	Hypervisor	CHR
Baltic Vengeance	VM Ware ESXi 6.5	6.41.3

Throughput: 1.1 Gbps Peak VM CPU: 43%

Session: 10.255.236.16	0		CPU: 43% 🔳 🕅
Interface <ether2></ether2>			
General Ethernet Loo	op Protect Status Traffic		ОК
Tx/Rx Rate:	41.0 Mbps	/ 1107.8 Mbps	Cancel
Tx/Rx Packet Rate:	76 037 p/s	/ 923 181 p/s	Apply
FP Tx/Rx Rate:	0 bps	/ 0 bps	Disable
FP Tx/Rx Packet Rate:	0 p/s	/[0p/s	Comment
Tx/Rx Bytes:	40.8 GiB	/ 4289.7 GiB	Torch
Tx/Rx Packets:	650 829 762	/ 3494 941 812	Cable Test
Tx/Rx Drops:	0	/0	Blink
Tx/Rx Errors:	0	/0	Reset MAC Address

Design: CHR performance on VMWARE ESXi (full table + bw load)

Platform	Hypervisor	CHR
Baltic Vengeance	VM Ware ESXi 6.5	6.41.3

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5 Gbps load plus reset of both upstreams: Convergence Time – 11:05

Session: 10.255.236.160	CPU: 37% 🔳 🗎
BGP	
Instances VRFs Peers Networks Aggregates VPN4 Routes Advertisements	
🕂 🗕 🖌 🗶 🗁 🍸 Refresh Refresh All Resend Resend All	Find
Name 🔨 Remote Address Remote AS Uptime Prefix Co State	
CLINX (IPA-JXN-7606-01) 100.76.1.1 65001 00:11:05 527926 established	
Contract 10.255.236.150 8675309 00:11:06 680122 established	
150 (bgp2.tutone.net (ESXi)) - WinBox v6.41.3 on CHR (x86_64) —	
Session: 10.255.236.150	CPU: 12% 📕 🔒
BGP	
Instances VRFs Peers Networks Aggregates VPN4 Routes Advertisements	
🛨 🗁 🖉 🕅 🍞 Refresh All Resend Resend All	Find
Name Address Remote AS Uptime Prefix Count State	•
REDE-CIX (IPA-JXN-7606-01) 100.76.3.1 16695 00:11:06 680122 established	
Repp1.tutone.net 10.255.236.160 8675309 00:11:06 99048 established	

Platform	Hypervisor	CHR
Baltic Vengeance	ProxMox (KVM) 5.1	6.41.3

DE-CIX March 2018 Routing Table: Time - 26 seconds

BGP												
Instances	VRFs	Peers	Network	s Aggrega	tes V	PN4 Rou	ites A	dvertiseme	nts			
+ -	 Image: A start of the start of	K 🗖	7	Refresh	Ref	resh All	Rese	end Re	send All			
Name			1	Remote Ad	dress	Remot	e AS	Uptime	Prefix	Count	State	T
CI-CI	X (IPA-J	XN-7606	-01)	100.76.3.1			16695	00:00:2	5	680122	established	Í.
sbgp1	tutone.n	et		10.255.236	.157	8	675309		-		idle	1

Design: CHR performance on Proxmox (KVM) (2 Full Tables)

Platform	Hypervisor	CHR
Baltic Vengeance	ProxMox (KVM) 5.1	6.41.3

DE-CIX and LINX March 2018 Routing Table: Time – 1:34

						-				
BGP										
Instances	VRFs F	Peers	Networks	s Aggregate	s VPI	V4 Routes	Adve	rtisements	1	
+ -	* X		T	Refresh	Refres	h All 🛛 Re	esend	Rese	nd All	
Name			A	Remote Addr	ess	Remote AS	Up	time	Prefix Count	State
🔹 😪 DE-CI	X (IPA-JXI	N-7606	01)	100.76.3.1		166	95	00:01:34	680122	established
🛛 😪 bgp 1.t	utone.net			10.255.236.1	57	86753	09	00:01:33	97225	established
157 (bgp1.tu ;hboard Session: 1										
BGP										
Instances	VRFs	Peers	Network	s Aggregate	es VP	N4 Routes	Adve	rtisements	3	
+ -	* X		T	Refresh	Refres	h All R	esend	Rese	nd All	
Name			Δ.	Remote Add	ress	Remote AS	6 Up	otime	Prefix Co /	State
LINX	(IPA-JXN-	7606-0	1)	100.76.1.1		650	001	00:01:38	527926	established
Sbgp2:	tutone.net			10.255.236.1	162	86753	309	00:01:34	680122	established

Design: CHR performance on Proxmox (KVM) (1500 byte MTU)

Platform	Hypervisor	CHR
Baltic Vengeance	ProxMox (KVM) 5.1	6.41.3

Throughput: 4.4 Gbps Peak VM CPU: 28%

Interface <ether3></ether3>				
General Ethernet Loo	p Protect Status Traffic		OK	
Tx/Rx Rate:	62.7 Mbps	/ 4.4 Gbps	Cancel	
Tx/Rx Packet Rate:	114 219 p/s	/ 87 605 p/s	Apply	
FP Tx/Rx Rate:	0 bps	/ 0 bps	Disable	
FP Tx/Rx Packet Rate:	0 p/s	/ 0 p/s	Comment	
Tx/Rx Bytes:	20.9 C:P	/ 1974.5 GiB	Torch	
Tx/Rx Packets:		/ 351 929 882	Cable Test	
Tx/Rx Drops:		/ 0	Blink	
Tx/Rx Errors:		/ 0	Reset MAC Address	
Tx Packet: 114 219 p/s Rx Packet: 87 605 p/s				
enabled	running	slave	ink ok	

Design: CHR performance on Proxmox (KVM) (512 byte MTU)

Platform	Hypervisor	CHR
Baltic Vengeance	ProxMox (KVM) 5.1	6.41.3

Throughput: 1.8 Gbps Peak VM CPU: 29%

Interface <ether3></ether3>				
General Ethernet Loo	op Protect Status Traffic		ОК	
Tx/Rx Rate:	51.8 Mbps	/ 1892.1 Mbps	Cancel	
Tx/Rx Packet Rate:	95 050 p/s	/ 74 091 p/s	Apply	
FP Tx/Rx Rate:	0 bps	/ 0 bps	Disable	
FP Tx/Rx Packet Rate:	0 p/s	/ 0 p/s	Comment	
Tx/Rx Bytes:	40.0 GiB	/ 2344.5 GiB	Torch	
Tx/Rx Packets:		/ 464 735 383	Cable Test	
Tx/Rx Drops:	0	/0	Blink	
Tx/Rx Errors:	0	/ 0	Reset MAC Address	
Tx: 51.8 Mbps Rx: 1892.1 Mbps Tx: 55.00 p/s Rx Packet: 95 050 p/s Rx Packet: 74 091 p/s				
enabled	running	slave	nk ok	

Design: CHR performance on Proxmox (KVM) (96 byte MTU)

Platform	Hypervisor	CHR
Baltic Vengeance	ProxMox (KVM) 5.1	6.41.3

Throughput: 423 Mbps Peak VM CPU: 28%

Interface <ether3></ether3>					
General Ethemet Loo	p Protect Status Traffic		ОК		
Tx/Rx Rate:	47.7 Mbps	/ <mark>423.4 Mbps</mark>	Cancel		
Tx/Rx Packet Rate:	87 945 p/s	/ 75 199 p/s	Apply		
FP Tx/Rx Rate:	0 bps	/ 0 bps	Disable		
FP Tx/Rx Packet Rate:	0 p/s	/ 0 p/s	Comment		
Tx/Rx Bytes:	44.0 GiB	/ 2411.7 GiB	Torch		
Tx/Rx Packets:	688 514 560	/ 516 684 408	Cable Test		
Tx/Rx Drops:	0	/0	Blink		
Tx/Rx Errors:	0	/0	Reset MAC Address		
Tx: 47.7 Mbps Rx: 423.4 Mbps					
Tx Packet: 87 945 p/s Rx Packet: 75 199 p/s					
enabled	running	slave link ok			

Design: CHR performance on PROXMOX (KVM)(full table + bw load)

P

Platform	Hypervisor	CHR
Baltic Vengeance	VM Ware ESXi 6.5	6.41.3

5 Gbps load plus reset of both upstreams: **Convergence Time – 9:03**

BGP			a 2
Instances VRFs Peers Network	s Aggregates VPN	N4 Routes Advertisements	
+- ~ ~ ~ 7	Refresh Refres	h All Resend Resend	All Find
Name	Remote Address	Remote AS Uptime Pro	efix Co 🛆 State
CINX (IPA-JXN-7606-01)	100.76.1.1	65001 00:09:03	527926 established
spgp2.tutone.net	10.255.236.162	8675309 00:09:03	680122 established
62 (bgp2.tutone.net (ProxMox)) - V hboard	/inBox v6.41.3 on C	HR (x86_64)	- 🗆 X
Session: 10.255.236.162			CPU: 0% 📕 词
BGP			🗐 🛛
Instances VRFs Peers Network	s Aggregates VPN	N4 Routes Advertisements	
+- 🖉 🕾 🍸	Refresh Refres	h All Resend Resend	All Find
Name	Remote Address	Remote AS Uptime Pre	efix Count State 🗸
RDE-CIX (IPA-JXN-7606-01)	100.76.3.1	16695 00:09:06	680122 established
des bgp 1.tutone.net	10.255.236.157	8675309 00:09:03	99048 established



IP

Platform	Hypervisor	CHR
Baltic Vengeance	Hyper-V 2012	6.41.3

DE-CIX March 2018 Routing Table: Time - 12 seconds

nstances VRFs Peers Networks	Aggregates	VPN4 Rou	utes Adve	ertisements			
+ - 💽 🗶 🗖 🍸	Refresh R	Refresh All	Resend	Resend All			
Name	Remote Addr	ress Rer	mote AS	Remote ID	Uptime	Prefix Count	State
LINX (IPA-JXN-7606-01)	100.76.1.1	1000 C	65001	100.76.2.1	00:00:12	527926	established
@bgp2tutone.net	10.255.227.3	37	8675309				idle

Design: CHR performance on Hyper V (Microsoft)(2 full tables)

F

Platform	Hypervisor	CHR
Baltic Vengeance	Hyper-V 2012	6.41.3

DE-CIX and LINX March 2018 Routing Table: Time - 41 seconds

Session: 10.255.227.36 Memo	ry: 3371.6 MiB	CPU: 12%	
BGP			
Instances VRFs Peers Networks Aggregates VPN4 Routes Advertisements			
🛨 🗕 🗸 🖄 🍸 Refresh Refresh All Resend Resend All		Find	d
Name / Remote Address Remote AS Remote ID Uptime Prefix Count	State /		•
	established		
R bgp2 tutone net 10.255.227.37 8675309 100.76.3.2 00:00:42 680122	established		
2 items (2 selected)			
.37 (bgp2.tutone.net (HyperV)) - WinBox v6.41.3 on CHR (x86_64)	-		×
shboard			
Session: 10.255.227.37 Memory	3456.2 MiB	CPU:0%	- 6
BGP		[
Instances VRFs Peers Networks Aggregates VPN4 Routes Advertisements			
🕂 🗕 🗸 🖾 🍸 Refresh Refresh All Resend Resend All		Find	
Name / Remote Address Remote AS Remote ID Uptime Prefix Count St	tate		•
CECIX (IPA-JXN-7606-01) 100.76.3.1 16695 100.76.2.1 00:00:43 680122 et	tablished		
Step 1 tutone net 10.255.227.36 8675309 100.76.1.2 00:00:42 98884 es	stablished		

Design: CHR performance on Hyper-V (Microsoft)(1500 byte MTU)

Platform	Hypervisor	CHR
Baltic Vengeance	Hyper-V 2012	6.41.3

Throughput: 4.4 Gbps Peak VM CPU: 32%

Interface <ether3></ether3>					
General Ethernet Loo	op Protect Status Traffic		OK		
Tx/Rx Rate:	62.7 Mbps	/ 4.4 Gbps	Cancel		
Tx/Rx Packet Rate:	114 219 p/s	/ 87 605 p/s	Apply		
FP Tx/Rx Rate:	0 bps	/ 0 bps	Disable		
FP Tx/Rx Packet Rate:	0 p/s	/ 0 p/s	Comment		
T. (D. D. (20.0.00	(1074 E C'D	Torch		
Tx/Rx Bytes:		/ 1974.5 GiB	Cable Test		
Tx/Rx Packets:		/ 351 929 882	Blink		
Tx/Rx Drops:					
Tx/Rx Errors:		/0	Reset MAC Address		
Tx: 62.7 Mbps Rx: 4.4 Gbps					
Tx Packet: 114 219 p/s Rx Packet: 87 605 p/s					
enabled	running	slave link ok			

Design: CHR performance on Hyper-V (Microsoft)(512 byte MTU)

Platform	Hypervisor	CHR
Baltic Vengeance	Hyper-V 2012	6.41.3

Throughput: 1.6 Gbps Peak VM CPU: 33%

Interface <ether2></ether2>				
General Ethernet Loo	p Protect Status Traffic		ОК	
Tx/Rx Rate:	64.7 Mbps	/ 1666.5 Mbps	Cancel	
Tx/Rx Packet Rate:	116 975 p/s	/ 368 061 p/s	Apply	
FP Tx/Rx Rate:	0 bps	/ 0 bps	Disable	
FP Tx/Rx Packet Rate:	0 p/s	/0p/s	Comment	
Tx/Rx Bytes:	3309.1 MiB	/ 86.8 GiB	Torch	
Tx/Rx Packets:	50 617 815	/ 164 610 233	Cable Test	
Tx/Rx Drops:	0	/0	Blink	
Tx/Rx Errors:	0	/0	Reset MAC Addre	ess
Ix/Rx Errors: 0 70 Reset MAC Address Tx: 64.7 Mbps Rx: 1666.5 Mbps 100 100 100 Tx: Packet: 1666.5 Mbps 100				
enabled	running	slave	k ok	

Design: CHR performance on Hyper-V (Microsoft)(96 byte MTU)

Platform	Hypervisor	CHR
Baltic Vengeance	Hyper-V 2012	6.41.3

Throughput: 646 Mbps Peak VM CPU: 37%

Interface <ether2></ether2>					
General Ethemet Loo	p Protect Status Traffic		ОК		
Tx/Rx Rate:	67.6 Mbps	/ 646.5 Mbps	Cancel		
Tx/Rx Packet Rate:	123 480 p/s	/ 538 817 p/s	Apply		
FP Tx/Rx Rate:	0 bps	/ 0 bps	Disable		
FP Tx/Rx Packet Rate:	0 p/s	/ 0 p/s	Comment		
Tx/Rx Bytes:	7.7 GiB	/ 141.1 GiB	Torch		
Tx/Rx Packets:	120 370 122	/ 391 011 193	Cable Test		
Tx/Rx Drops:	0	/0	Blink		
Tx/Rx Errors:	0	/0	Reset MAC Address		
Tx: 67.6 Mbps Rx: 646.5 Mbps					
Tx Packet: 123 430 p/s Rx Packet: 538 817 p/s					
enabled	running	slave link ok			

Design: CHR performance on Hyper-V (Microsoft)(96 byte MTU)

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Platform	Hypervisor	CHR
Baltic Vengeance	Hyper-V 2012	6.41.3

5 Gbps load plus reset of both upstreams: **Convergence Time – :43**

BGP						Ξ×
Instances VRFs Peers Network	s Aggregates VP	N4 Routes Ad	dvertisement	s		
+- * * 🖉 🍸	Refresh Refre	sh All Rese	nd Rese	nd All		Find
Name 🛆	Remote Address	Remote AS	Uptime	Prefix Co	State	-
RLINX (IPA-JXN-7606-01)	100.76.1.1	65001	00:00:42	527925	established	
Bgp2.tutone.net	10.255.227.37	8675309	00:00:41	679894	established	
7 (bgp2.tutone.net (HyperV)) - Wir hboard	1Box v6.41.3 on CH	R (x86_64)			— C) ×
Session: 10.255.227.37						— 🗎
BGP						🗉 🗙
Instances VRFs Peers Network	as Aggregates VP	N4 Routes Ad	dvertisement	S		
╋ ─ <> <> <> <> <> <> <> <> <> <> <> <> <>	Refresh Refre	sh All Rese	nd Rese	nd All		Find
Name 🛆	Remote Address	Remote AS	Uptime	Prefix Co	State	-
RDE-CIX (IPA-JXN-7606-01)	100.76.3.1	16695	00:00:43	679894	established	
Rbgp1.tutone.net	10.255.227.36	8675309	00:00:41	99012	established	

Design: CHR real world performance example - PogoZone



IP

Home Business Residential Internet Service About Blog Support

Your local internet source for the **Pacific Northwest** Residential **Business** \frown

Design: CHR real world performance example - PogoZone

US WISP-Throughput: **1.6 Gbps** Peak VM CPU: **32%**



	Session:											
Quick Set	Interface List											
CAPsMAN	Interface Interface List Ethemet E	EoIP Tunnel IP Tunnel Gi	RE Tunnel VLAN VRRP Bor	nding LTE								
Interfaces											Find	
Wireless	Name / Type Actual MTU L2 MTU Tx Rx Tx Packet (p/s) Rx Packet (p/s) FP Tx R					FP Rx	FP Tx Packe	omment				
	R 1ttLo0	Bridge	1500 65535	0 bps	0 bps	0	0	0 bps 0 bps	0 bps 0 bps	0 0		
	R +>V2001-Core-to-Edge	Ethernet Ethernet	1500 1500	1675.0 Mbps 6.8 kbps	223.1 Mbps 3.4 kbps	157 063	108 400	0 bps 0 bps	0 bps 0 bps	0 0		
P N	R 4>	Ethernet	1500	138.6 Mbps	319.6 Mbps	41 860	37 235	0 bps	0 bps	0 0		
Pv6 D	R 🔹	Ethernet Ethernet	1500 1500	0 bps 79.3 Mbps	1920 bps 1351.6 Mbps	0 63 520	4 116 909	0 bps 0 bps	0 bps 0 bps	0 0		
	R 🚸	GRE Tunnel	1476 65535	3.8 Mbps	4.3 kbps	3 009	5	0 bps	0 bps	0 0		
Routing N	R 🏶	6to4 Tunnel	1480 65535	0 bps	0 bps	0	0	0 bps	0 bps	0 0		
System 🗅	Interface 2001 Core to Edge											
Queues	General Ethernet Loop Protect St	tatus Traffic							ОК	7		Find
Files	Tx/Rx Rate: 1675.0 Mbps	3			/ 223.1 Mbps				Cancel	CPU / Load (%) IRQ (
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- Which Hypervisor is the best?
 - #1 Hyper-V was faster than ESXi and ProxMox all the way around and the most consistent with results in testing. It was by far the clear winner in routing convergence times
 - #2 ProxMox KVM delivered much better convergence speeds than ESXi but not quite as good as Hyper-V
 - #3 VM Ware ESXi was the slowest in everything but raw throughput and it only has a marginal edge over Hyper-V in that area.



Questions??