

VM	CPU	MEM (Gb)	DISK (Gb)	VDC/additional disk (SSD)	VDC/additional disk	Intercluster Interface	Public Interface (/28)	Purpose
slb1	1	1	6			Needed	Needed	Load balancer
slb2	1	1	6			Needed	Needed	Load balancer
fe1	2	8	6		10	Needed	Needed	Client session management
fe2	2	8	6		10	Needed	Needed	Обслуживание клиентских сессий
mg1	4	4	6		10	Needed	Needed	Media processing
mg2	4	4	6		10	Needed	Needed	Media processing
be1	2	4	6		10	Needed		Data storage
be2	2	4	6		10	Needed		Data storage
aux1	1	2	6		10	20 Needed		Platform services: internal services, fax, call control, etc
aux2	1	2	6		10	20 Needed		Platform services: internal services, fax, call control, etc
crm1	1	2	8		4	Needed	Needed	CRM services, email
crm2	1	2	8		4	Needed	Needed	CRM services, email
ch1	2	16	8		50	Needed		clickhouse
ch2	2	16	8		50	Needed		clickhouse
kafka1	2	8	6		30	Needed		Clustering (zookeeper), queue broker (kafka), data processing (cdr-processor)
kafka2	2	8	6		30	Needed		Clustering (zookeeper), queue broker (kafka), data processing (cdr-processor)
callhist1	1	4	6		4	Needed		HA cluster: cdr-rest-server, cdr-notification
callhist2	1	4	6		4	Needed		HA cluster: cdr-rest-server, cdr-notification
records1	2	4	6		100	1000 Needed		Call recording storage
records2	2	4	6		100	1000 Needed		Call recording storage
spamfeeder1	1	6	6		10	Needed		Auto-notification
spamfeeder2	1	6	6		10	Needed		Auto-notification
scp1*	1	2	6		10	Needed		CAMEL/M3UA
scp2*	1	2	6		10	Needed		CAMEL/M3UA
monitoring	4	12	4		200	1000 Needed		Log aggregator, monitoring database, backups, arbiter (zookeeper) for clickhouse and kafka
Summary	44	134	156		696	3040		
Floating VIP address on paired nodes, except for fe and mg nodes								

Appendix 1: Virtual Machine Requirements

Enabled Latency Sensitivity option for VM centrex- (fe/be/mg) to "High" (minimum for MG)* (VMware) - Latency Sensitivity option for VM centrex- (fe/be/mg) enabled to "High" (minimum for MG)* (VMware)

Failover support for all cluster VMs (VMware) - Failover support for all cluster virtual machines (VMware)

Ability to disable VM backup using virtualization platform tools. (VMware) - Ability to disable VM backup using virtualization platform tools. (VMware)

VM resource reservation on the host. (Reservation cpu/memory) (VMware) - VM resource reservation on the host. (CPU/memory reservation) (VMware)

Disabled VM migration mechanism between hosts under high node load. (vMotion) (VMware) - Disabled VM migration mechanism between hosts under high node load. (vMotion) (VMware)

Dedicated VLAN between all VMs for inter-cluster interaction, multicast traffic passing - Dedicated VLAN between all virtual machines for inter-cluster interaction, multicast traffic passing

Appendix 2: Initial Hardware Preparation and OS Installation Requirements (in case the partner cannot provide us with access)

Virtual machine creation guidelines:

Operating System: Linux Debian latest stable version (<https://www.debian.org/CD/netinst/>)

File System: BTRFS (an additional disk will be used during service software installation)

Configuration: Standard + SSH Server (no graphical shells, web, or print services)

SSH access: Ensure SSH access from the following addresses to VMs with public network interfaces: 109.69.180.240/29, 5.164.24.127, 195.16.38.189, 109.69.176.210

	From server/system	From port	To server/system	To port	Protocol	
From Cluster to Cluster		1-65535 + Multicast		1-65535 + Multicast	any	CLUSTER, IN/OUT intercluster
From client to SLB	client IP	1024-65535		80 tcp, 443 tcp, 5060 tcp/udp, 5061 tcp, 8080 tcp	http, https, sip, sip tls, websocket	
From client to FE				80 tcp, 443 tcp, 5060 tcp/udp, 5061 tcp, 8080 tcp	http, https, sip, sip tls, websocket	
From client to MG				30000-65535 udp	rtp	EXTERNAL, IN from client
From DT to SLB	109.69.180.240/29, 109.69.176.128/25	1024-65535		22 tcp	ssh	
From DT to FE				22 tcp	ssh	
From DT to MG				23 tcp	ssh	
From DT to Auxiliary					ssh	
					23 tcp	
				ssh	EXTERNAL, IN from DT	
From MAIL Server to External		25, 465, 1024-65535	any (External SMTP)	25, 465, 587, 443 tcp	smtp,smtp tls	
From FE, SIP		5060	SIP	any SIP Ports tcp/udp	sip	
From FE, HTTP		1024-65535	any (CRM rest api, CRM b24, STT)	any tcp	http, https	
From CRM, HTTP		1024-65535	any (amoCRM, CRM b24)	any tcp	http, https	
From MG, RTP		30000-65535	any RTP Ports	any RTP Ports udp	rtp	
From Cluster to DT repo		1024-65535	109.69.180.2	22, 80, 443 tcp	ssh,https	
From Cluster to Debian repo		1024-65535	deb.debian.org security.debian.org	21, 80, 443 tcp	ftp, http, https	
From Cluster to Clickhouse repo		1024-65535	188.114.99.192	21, 80, 443 tcp	ftp, http, https	
From Cluster to DT Git		1024-65535	109.69.180.2	22, 80, 443 tcp	ssh, https	
From Cluster to DNS		1024-65535		53 tcp/udp	dns	
From Cluster to NTP		1024-65535		123 tcp/udp	ntp	EXTERNAL, OUT from platform