

OSM-MR10, OSM Ecosystem Day

On the use of OSM to allow for automated network slice scaling in multi-site environments

Jose Ordonez-Lucena (Telefónica)



PoC overview



Presentation of ZSM PoC#2

- **PoC objective**: Demonstrate the capacity to automatically scale out a deployed network slice instance across multiple administrative domains
- PoC timeline: 01.01.2021-31.03-2021 (3 months)
- Alignment with ZSM
 - ZSM001 (Use Cases) and ZSM003 (Network slicing features)





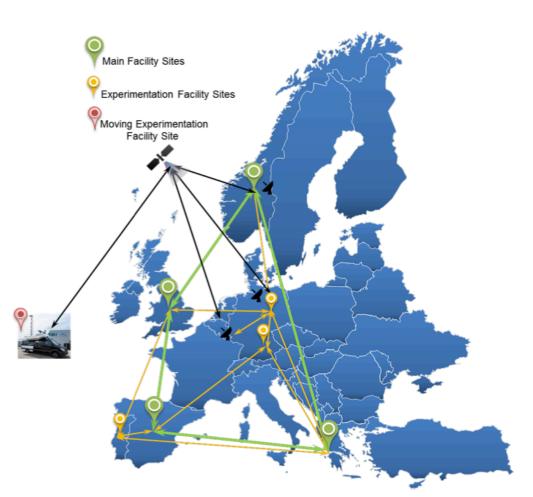
Agenda

Background information

- PoC: Automated Network Slice Scaling In Multi-Site Environments
- PoC: OSM domain (steps 1-6)
- Concluding remarks

5G-VINNI project

- **5G-VINNI project's vision:** build an open large-scale 5G Endto-End (E2E) facility that can
 - demonstrate that they 5G network KPIs can be met
 - be validated, accessed and used by vertical industries to test use cases and validate KPIs.
- 5G-VINNI built out of a set of **interworking** facility sites
- Main facility sites: offer E2E 5G network capabilities to realworld verticals, with well-defined SLAs
 - Oslo-Kongsberg (Norway); Martlesham (UK); Madrid (Spain); Patras (Greece)
- **5G-VINNI experimentation facility sites**: provide environment for advanced experimentation and testing possibilities on (combination of) elements of the E2E model
 - Aveiro (Portugal); Berlin (Germany); Munich (Germany)
- Moving experimentation Facility site: satellite connected vehicle

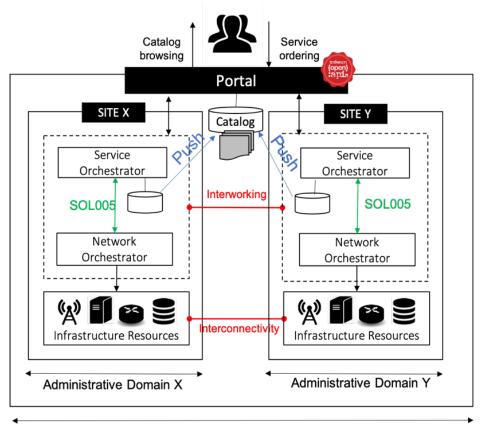




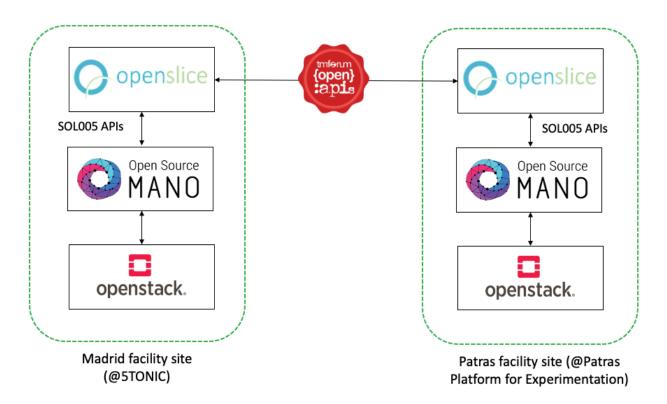
5G-VINNI facility architecture



From a generic 5G-VINNI facility blueprint...



.... to a specific 5G-VINNI facility realization

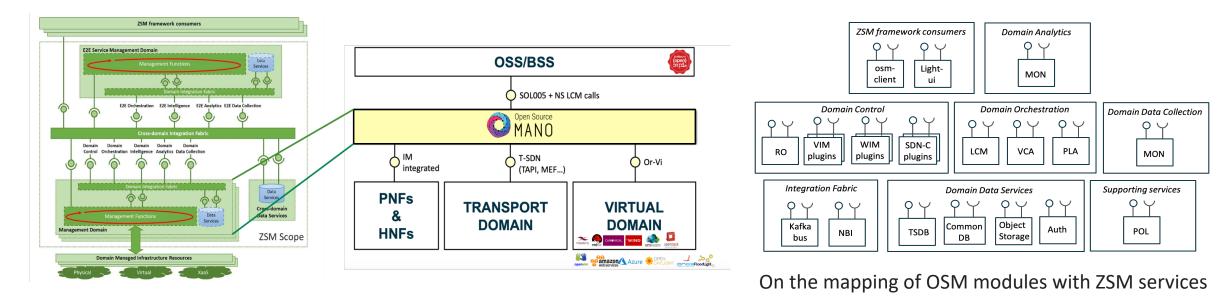


The PoC makes use of the assets from these two 5G-VINNI facility sites

OSM – Release EIGHT



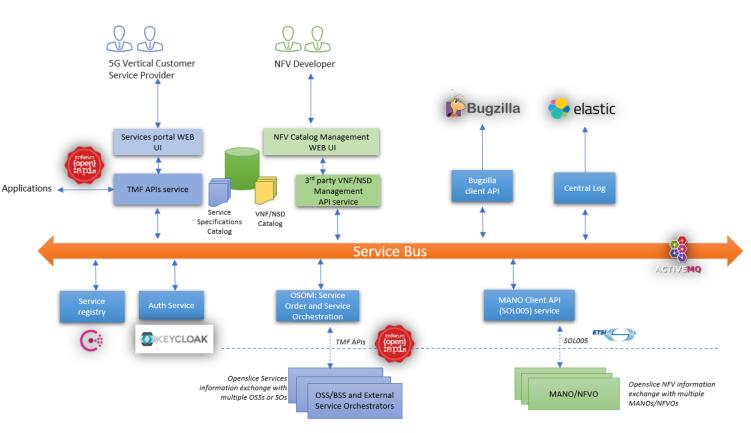
- Alignment with ETSI ISG ZSM architecture (cf. ZSM002)
 - OSM can be mapped to a ZSM management domain
 - OSM stack aligned with ZSM architecture principles (SBMA, modularity, scalability, zero-touch,...)
- From OSM perspective, OpenSlice behaves as upper OSS/BSS layer
 - OpenSlice (Service Orchestrator) consumes OSM NBI capabilities.



OpenSlice



- Open-source operations support system (OSS) solution providing Service Orchestration functionality
 - Including both service fulfillment and assurance lifecycle phases
- **CFS viewpoint**: user-friendly web portal for the interaction with the vertical customers:
 - Browse slice templates (VINNI-SB's) in the Service Catalog.
 - Issue and capture service orders
 - Retrieve PM/FM data on deployed slices.
- RFS viewpoint: consumption of OSM NBI capabilities to deploy and operate the virtualized components of the slices.



Link: https://openslice.io



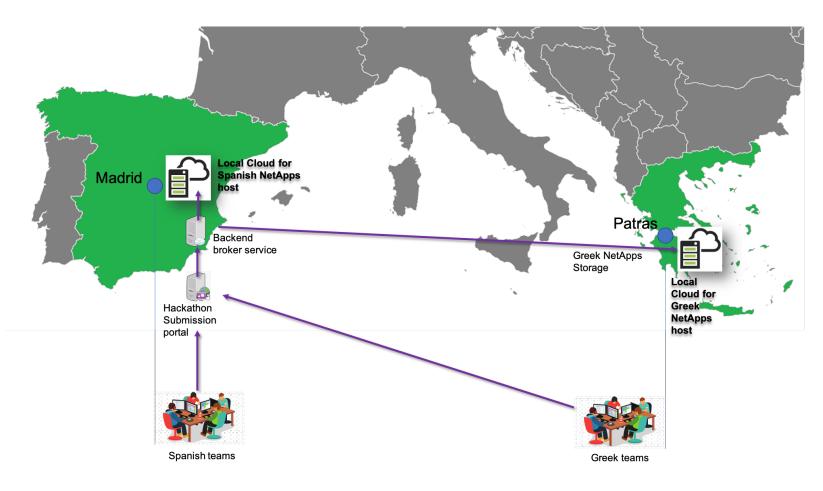
Agenda

• Background information

- PoC: Automated Network Slice Scaling In Multi-Site Environments
- PoC: OSM domain (steps 1-6)
- Concluding remarks

Scenario description

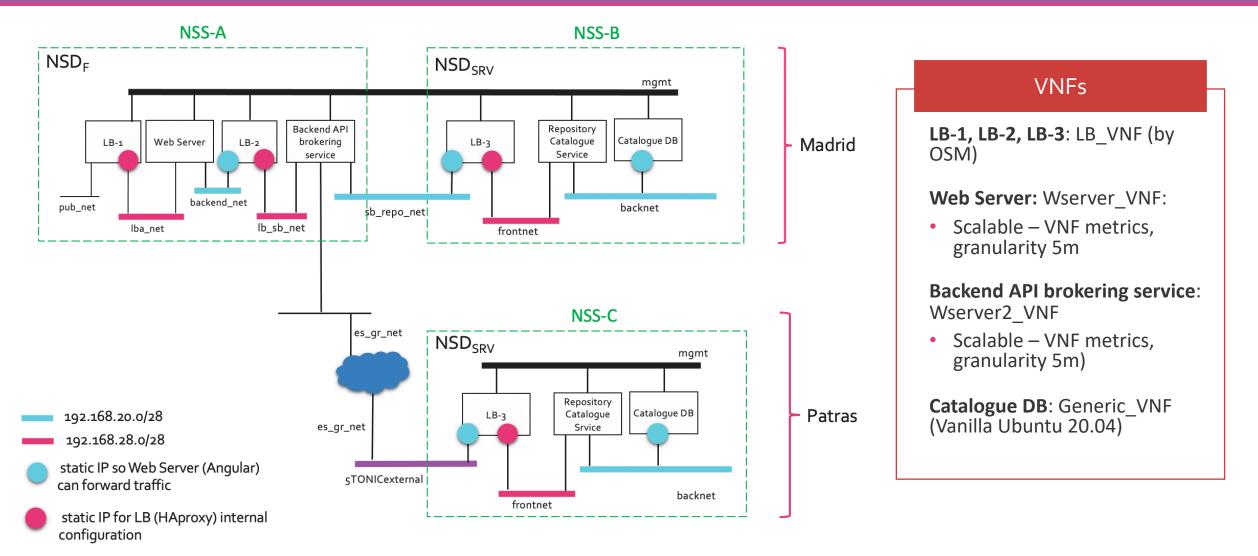




- Vertical industry (e.g., PPDR, e-Health) NetApps hackathon
 - Involving developers from Spain and Greece
 - NetApp submission service hosted in Madrid facility site
 - Re: GPDR policy, NetApps binaries and data must be hosted in the home country.
- Network slice scaling out operation:
 - Automatically triggered in Madrid, because of unexpected load surges
 -> reactive correction action
 - Propagated towards Patras, due to forecasting reasons -> pro-active corrective action



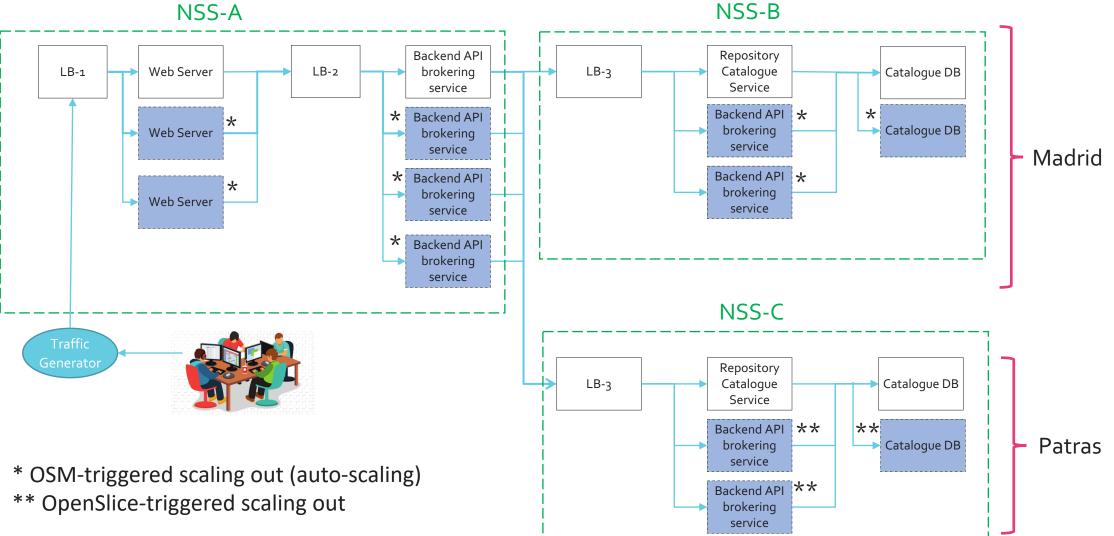
Multi-site NW slice – design & deployment



Multi-site NW slice – operation



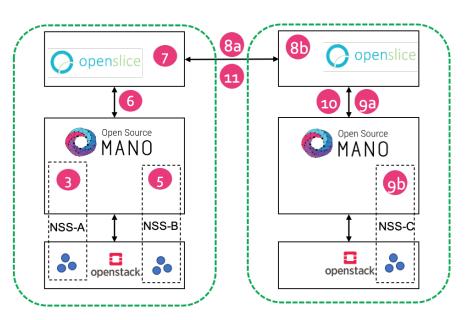
NSS-A

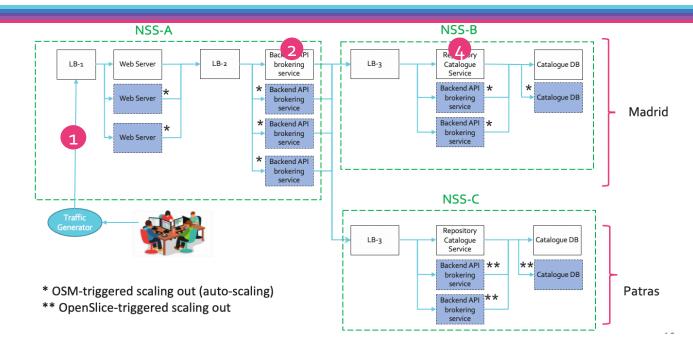


PoC user story



12

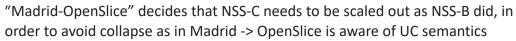






7

"Madrid-OSM" notifies "Madrid-OpenSlice" of successul steps 3 and 5





"Madrid-OpenSlice" issues NSS-C scaling request to "Patras-OpenSlice", using TMF's APIs. "Patras-OpenSlice" checks this request.



10

"Patras-OpenSlice" forwards the request to the "Patras-OSM" for enforcement. Unlike step 3 and 5, here **there is no NSS-C auto-scaling**

"Patras-OSM" notifies "Madrid-OpenSlice" of NSS-C scaling out.

"Patras-OpenSlice" notifies "Madrid-OpenSlice" of successful NSS-C scaling out.

- There is a sudden high demand of portal interaction at Madrid facility site (HTTP requests represents a traffic load surge with 3:1 ratio)
- NSS-A's backend API brokering service collapses, being not able to forward traffic to etiher NSS-B or NSS-C
- Based on day-2 activities, "Madrid-OSM" triggers **NSS-A auto-scaling** -> Web server (2 x scale out), LB-1 (reconfiguration), LB-2 (reconfiguration)



5

© ETSI

NSS-A's backend API brokering service back on normal operation, and starts sending traffic to NSS-B through LB-3. NSS-B's VNFs collapse.

Based on day-2 activities, "Madrid-OSM" triggers **NSS-B auto-scaling** -> Repository catalogue (2x scale out), DB (1 x scale out), LB-3 (reconfiguration)

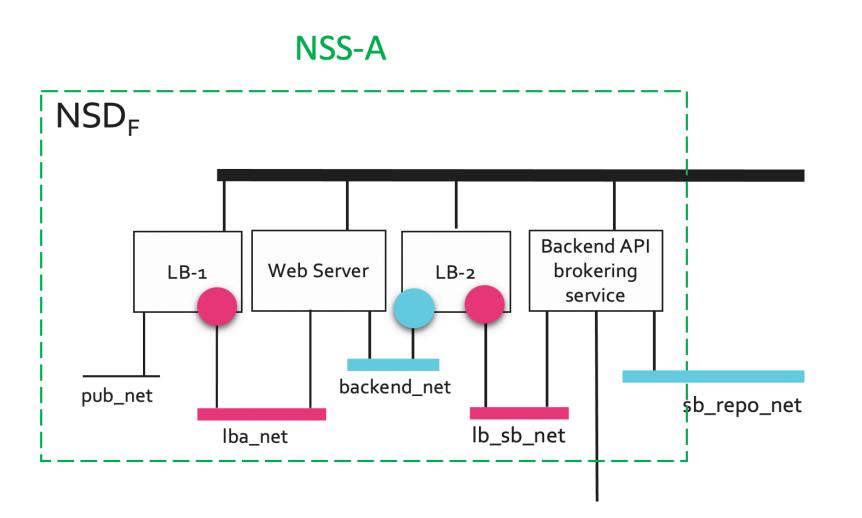


Agenda

- Background information
- PoC: Automated Network Slice Scaling In Multi-Site Environments
- PoC: OSM domain (steps 1-6)
- Concluding remarks

NSS-A Topology





- LB_VNF:
 - CPU: 4
 - RAM: 4 GB
 - Disk: 10 GB
 - Name in NSD-F: "haproxy_ubuntu" [image]
- Wserver_VNF (Scalable VNF metrics, granularity 5min):
 - CPU: 1
 - RAM: 1 GB
 - Disk: 10 GB
 - Name in NSD-F: "ubuntu-20.04server-cloudimg-amd64" [image]

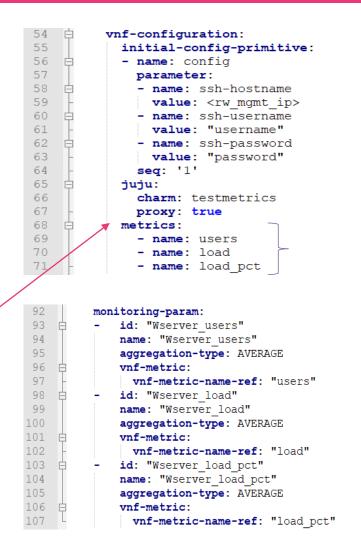
Wserver_VNF: VNFD



Collecting VNF metrics

 A simple charm containing a metrics.yaml file at its root folder specifies the metrics to be collected and associated comments

1	∣⊐me	trics:
2	_ ⊨	users:
3		type: gauge
4		description: "# of users"
5	-	command: who wc -1
6	Ц.	load:
7		type: gauge
8		description: "5 minute load average"
9	-	command: cat /proc/loadavg awk '{print \$1}'
10	þ	load pct:
11		type: gauge
12		description: "1 minute load average percent"
13		command: cat /proc/loadavg awk '{load pct=\$1*100.00} END {print load pct}'



Wserver_VNF: VNFD



• Autoscaling

Metric	Value
Minimum instance count	0
Maximum instance count	3
CPU-scale-in-threshold (%)	20
CPU-scale-out-threshold (%)	80
threshold-time (s)	10
cooldown-time (s)	30

	<pre>scaling-group-descriptor: name: "Wserver autoscale"</pre>
T	—
	min-instance-count: 0
	max-instance-count: 3
	scaling-policy:
þ	 name: "Wserver_load_pct_above_threshold"
	<pre>scaling-type: "automatic"</pre>
	threshold-time: 10
	cooldown-time: 30
	scaling-criteria:
ф –	 name: "Wserver load pct above threshold"
	scale-in-threshold: 20
	scale-in-relational-operation: "LT"
	scale-out-threshold: 80
	scale-out-relational-operation: "GT"
-	<pre>vnf-monitoring-param-ref: "Wserver load pct"</pre>
	vdu:
	- vdu-id-ref: Wserver
	count: 1



Agenda

- Background information
- PoC: Automated Network Slice Scaling In Multi-Site Environments
- PoC: OSM domain (steps 1-6)
- Concluding remarks



- ZSM poC#2 pipeline, with all ingredients
 - Research + Experimentation + Standardization
 - Open-source communities (OSM and OpenSlice) along the entire path
- ZSM PoC#2 showcasing by early April
 - Current status: automated scaling at individual facility sites (steps 1-6)
 - Next steps: Cross-domain orchestration @OpenSlice (steps 7-11)
- PoC#2 wikipage: <u>https://zsmwiki.etsi.org/index.php?title=PoC_2_Automated_Network_Slice_Scaling_in_Multi-Site_Environments</u>



Find us at: <u>osm.etsi.org</u> <u>osm.etsi.org/wikipub</u>



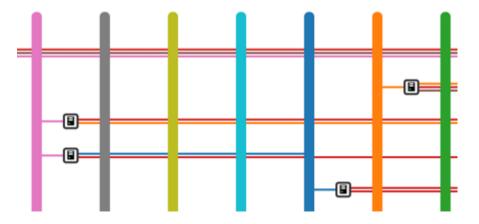


Annex A Scaling out in action

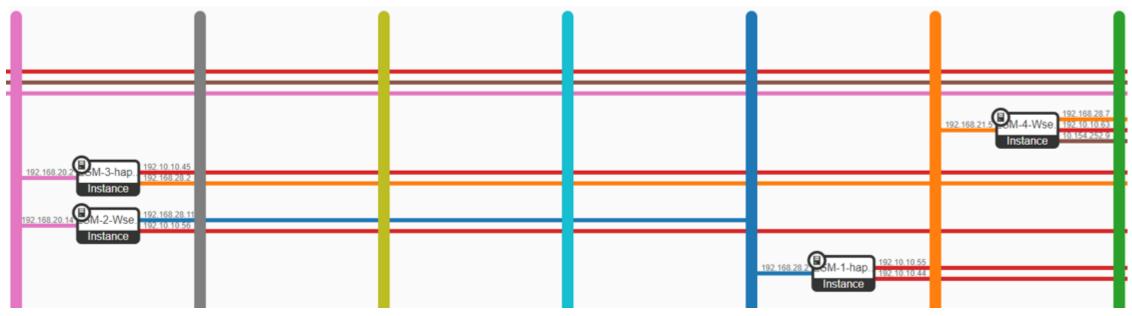


Scaling in action (pre-conditions)



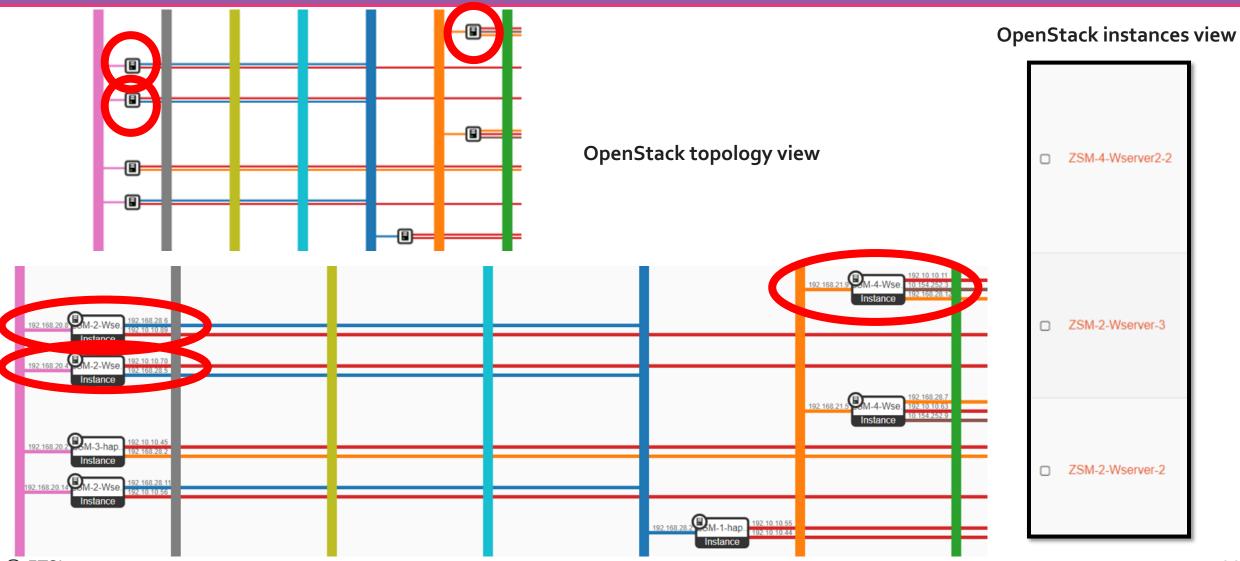


OpenStack topology view



Scaling in action (post-conditions)







Some scaling actions are completed successfully, and more are happening

History Of Operations

● PROCESSING COMPLETED COMPLETED							Entries	10	÷ Ø
Id	Type	Operation State	٥	Start Time	٥	Status Entered Time		¢ ،	Actions
ld	а Туре	Q. Select	\$	Start Time	Q	Status Entered Time		٩	
aedfa1e6-95ec-4bb4-90f0-265fc5dcbb49	instantiate	0		Mar-1-2021 13:57:32		Mar-1-2021 14:01:40		i	i
c00eea53-a2ad-476b-b0e6-0f4ddc6c8a7d	scale	Ø		Mar-1-2021 14:13:33		Mar-1-2021 14:14:22		i	i
d5360f8a-063a-4454-8cd5-086425e11eca	scale	Ø		Mar-1-2021 14:13:33		Mar-1-2021 14:15:36		i	i
c6465c34-b120-4f2d-85a3-358f99b7f623	scale	\bigcirc		Mar-1-2021 14:14:03		Mar-1-2021 14:15:41		i	i
2cf254fe-5bb3-4429-b2e3-beaa9726f4e5	scale	\bigcirc		Mar-1-2021 14:14:03		Mar-1-2021 14:16:28		i	i
3fa37b15-1b0a-4433-9d45-445b176def03	scale	\bigcirc		Mar-1-2021 14:14:33		Mar-1-2021 14:17:18		i	i
bda0d5a7-4b72-485c-9b7a-7f09dc8c09b9	scale	0		Mar-1-2021 14:15:03		Mar-1-2021 14:15:03		i	i
f7044603-eb27-4f93-a09b-4b0eed4674bc	scale	0		Mar-1-2021 14:15:04		Mar-1-2021 14:15:04		i	i
da9aabc3-b093-4156-bb70-b4fbe8af1e45	scale	0		Mar-1-2021 14:15:34		Mar-1-2021 14:15:34		i	i
07fbb624-5f08-40ac-a8cb-3c21c13601e5	scale	0		Mar-1-2021 14:15:34		Mar-1-2021 14:15:34		i	i



The dashboard shows the new nodes (1 initial plus 2 scaled out)

HAProxy

Statistics Report for pid 19594

General pr	roce	ess ir	nfori	mati	on																																	
= 19504 (proces ime = 0d 0h06m tem limits: men xsock = 4054; m rent conns = 1; c nning tasks: 1/18 hapro	n16s mmax naxco sument 3; idle	e unlimit onn = 200 nt pipes = = 100 %	ted; ulir 00; ma	xpipes	= 0	c												1	active active active active	DOWN, or backu or backu or backu	going up up DOWN up DOWN up SOFT S		DUP, goir DOWN, ecked nance (M for maint	tenance	Þ									Scope Scope Hide 1 Refree CSV	e : DOWN' se DOWN' se	ervers	<u>U</u> q	sources: imary site idates (v1.6 line manua
			0	ueue				Session ra	ite					Session	6				By	tes		enied			Errors			Warnings					Serve	er				
		Cur		ax	Limi	it	Cur	Max	Limit	Cu	ir I	Max	Limit		otal	LbTo	t	Last		Out	Reg	Resp		Reg	Conn	Resp	,	Retr Redis	Status	LastChk	Wght	Act			Chk	Dwn	Dwntme	Thrt
Frontend							0	0		-	0	0	2	000	0				0	0	c		0	0					OPEN									-
backer			Queue				Session						ssions				Bytes		Denie		0	Error				rnings		Part		Le altra		rver		- Pré		0.0	Durate	
node1	C	Cur I	Max	Lin	nit	Cur	Max	Limit	Cur	Ma	x L	Limit	Total	LbTo	t L	ast I	n Oi	ut Re	pq	Resp	Req	Conn	R	Resp	Retr	Redis	-	Status 6m16s DOWN		LastChk L4CON in Oms		Wght 1	Act	Bok	Chk	Dwn	Dwntme 1 6m16	T1
ode2	-	0	0		-	0		0		0	0				0	2	0	0		0			0		0		0	6m14s DOWN		L4TOUT in 2000ms		1			H		1 6m14	
node3		0	0			0		0		0	0		2		0	2	0	0		0			0	0	0		0	2m37s UP		L4OK in 0ms		1	Y			1	1 3m37	-
node4	+	0	0	<u> </u>		0		0		0	0	-	0		0	?	0	0		0			0	0	0		0	1m24s UP		L4OK in 0ms		1	Y			1	1 4m51	
10de5		0	0		-	0	(0		0	0	-	0		0	?	0	0		0			0	0	0	(0	6m14s DOWN		* L4TOUT in 2001ms		1	Y			1	1 6m14	4s
odeð		0	0		-	0		0		0	0	-	0		0	?	0	0		0			0	0	0	(0	6m15s DOWN		* L4TOUT in 2001ms		1	Y			1	1 6m15	5s
node7		0	0		-	0		0		0	0	-	0		0	?	0	0		0			0	<u>0</u>	0	(0	6m15s DOWN		* L4TOUT in 2000ms		1	Y			1	1 6m15	5s
node8		0	0		-	0		0		0	0	-	9		0	?	0	0		0			0	<u>0</u>	0		0	6m13s DOWN		L4TOUT in 2000ms		1		•	4	1	1 6m13	
node9		0	0		-	0		0		0	0	-	0		0	?	0	0		0			0	2	0		0	6m16s UP		L4OK in 0ms		1	Y	•		2		Ds
rode10 rode11	-	0	0		-	0		0		0	0	-			0	?	0	0		0			0	2	0		0	6m13s DOWN 6m12s DOWN	_	L4CON in 0ms * L4TOUT in 2001ms		1	Y	•	—	1	1 0m13 1 0m12	
rode11	-	0	0		-	0		0		0	0	-			0	?	0	0		0			0		0		0	6m12s DOWN		*L4TOUT in 2001ms		1	Y		H	1	1 0m12 1 6m12	
ackend		0	0		-	0		0		0	0	200	2		0	2	0	0	0	0			0	<u> </u>	0		0	6m16s UP		LATOOT IT 200 MIS		3	3	0				Ds
	tats					-		-		-	-		-		-		-	-	-				-		-							-					-	
			Qu					ession rate						essions					Bytes		Deni				Errors			Warnings					Server					
		Cur	Ma	x	Limit	0	ur	Max	Limit	Cur	Ma	ax	Limit	Tota	l l	LbTot	La	st ir	1 0	ut F	leq	Resp	Req	C	onn	Resp	R	etr Redis	Status	LastChk	Wght	A	ct E	3ck	Chk	Dwn	Dwntme	Th
Frontend	-					_	2	2		-	2	2	2 00	-	2				0	0	0	0		0					OPEN			_		-				_
Backend		0		0			0	0			0	0	20	0	0		0	0s	0	0	0	0			0	0		0 0	6m16s UP		0	(0	0		0		



Annex B The role of OpenSlice in the PoC



OpenSlice – service fulfillment



Service specification tree ServicePoC Spec bundle (CFS) AIIO MEST 641 OrderAPI order Openslice ServicePoC Spec bundle (CFS) OSOM Service Service Inventory Inventory Service (refers to SO as well) External Organization UUID Service Service Service Service Backend GR UUID Service Service Service Frontend Spec Frontend Spec Backend Frontend Spec Frontend **Backend GR** Backend from Greece (RFS): NSS-B (RFS): NSS-C (RFS): NSS-A OSM (NFVO) NSD_{F} $\mathsf{NSD}_{\mathsf{SVR}}$ **NSD**_{SVR} NS⊧ NS_{SRV} *****

Service ordering

Openslice

OSOM

NSSRV

OSM

(NFVO)

 $\overset{\text{Open Source}}{MANO}$

openslice

OpenSlice – service fulfillment



Main Order Properties	Order Rem's Service main properties	A	
Related Parties	ID.	Name State	PoC#2
Order ten #1	acol1438-5c2f-4989-4597-0/eft-c312010	20/702 8300	
сомяцтво	Service Type	Category	
You may select Order (tem)(s) to edit or terminate			
	Service Specification Characteristics allo	cated with Order New's Service ^	
	Characteristic	Value (Alas)	
	ZIM_MG_F-CONFIG	The second secon	
	ZSM,36,7,Mexilen/Minies,1	TRACKY	
	254,36,7:Metaer/Minder,2	200001	
	25M_HG_F:MemberVMFinder_3	2 (4)(40)	
	ZSM_NG_F:MemberVNFinder_4	4 (/oarse2_/M)	
	Z5M,345,7:36040	20.08	
	ZSM_NS_F: OMMINOprivider_Name	ON EQ-FORMUS	
	25M_NS_F: Uniformingitatus	CHECKED	
	25W_NG_F: PackageLocation	http://openalice.portalepi/10000/coapi/packages/toas00/c/lase=4c82/derb-baer6/7a5c1/6dHG - Ftargt (PackageLocation)	
	ZSM_NG_F:PackagingFormat	CONCIDIT (Recognyforme)	
	25M,363,755H82Y		
	23M_NS_F:rendor	rvendog	
		mad mitched 20 w/24-W x 402 4460 MID 912 ministrative of 11 0690 201622 4204-000 62 address from	
	25M_MS_SRV-CONFIG	Lineare Lyster, J. C. Manager, M. M. K. 1999, 2018. Sci 10.	
	ZSM_NS_SPV:Meniber/NPindex_1	1.6.249	
	25M_NS_SRV:3Member/MFindex_2	2 (Marcer_MVF)	
	ZSW_NG_SRV:Member//NFindex_3	3 (Generic, VV)	
	25M_N5_5RV:N5D1D	510	
	ZSM_NS_SRV:06444N0provider_Name	CEN EXPERIMENTS	
	25M_NS_SPV:OnBiointingStatus	checkloto	
	ZSW NS SPV:Packatel.ocation	http://topinalice-contaiso/12022-coase/backares/2ailer/271-62p6-41e74-62e60622022166 - SP/ tar.at: Packares.coastoni	
	ZSM_NG_SRV:PackaphyFormat	OSIADOR (Receptioned	Supporting Services allocated wi
	25M. NS. 5RV:52HEY		11 0
	ZSM,36,3W/wedgy	04000	
	ZSM_NG_SN_GR-CONFIG	A second se second second sec	active ZSM_NS_F ResourceFacingServiceSpecification
neoslice Seniors Nada	tplace Manage Services + Manage Brittles +		Resource beingser reespeenreuron
	25M_M6_9RV_GR: Member/MFindex_2	2 (Market_MP)	
	25M_HS_SRV_GR::WemberVMFinder_3	a (Generic, WP)	active ZSM_NS_SRV_GR
	ZSM_NG_SRV_GR:NSDID	26 (4)	ResourceFacingServiceSpecification
	ZSM_MS_SRV_GREOMMNOprevider_Name	CSI/ DO-Tomes	hesourcersengserneespeentedton
	ZSM_36_SW_00LON6cardingStatus	ONBOWDED	
	25M_Hi_SRV_GR:PackageLocation	http://openside.portalapin/dobb/opapingaciages/dallent/hit-dobb-ene/142e6/62000000000md - SR/rangt /Package.comony	
	25M_NG_SRV_GRcPackagingFormat	CONSIGNIT (RecoupingFormet)	active ZSMPoC
	ZSM_NG_SRV_GR:SSHRZY		CustomerFacingServiceSpecification
	ZSM,345,579,08: Vendor	(rendo)	CustomerFacingServiceSpecification
	Supporting Services allocated with Service		active ZSM_NS_SRV
	The July is f	TO THOSE APPOINTED AT MANAGED TO THE A MAY AND AN AND THE AND THE	
	EEE ZINUKUMUUU	See Choice ANTOINTEENEN, MARACED, See Care 4 Mar 2011, 16 Marce (and Tree)	ResourceFacingServiceSpecification
	TSUPPO Description for a first function	Southood ANTOINNICOLUCIANNICOLUCIAN AND SUS-INCOLUCIAN AND SUS-INCOLUCIAN AND SUST	

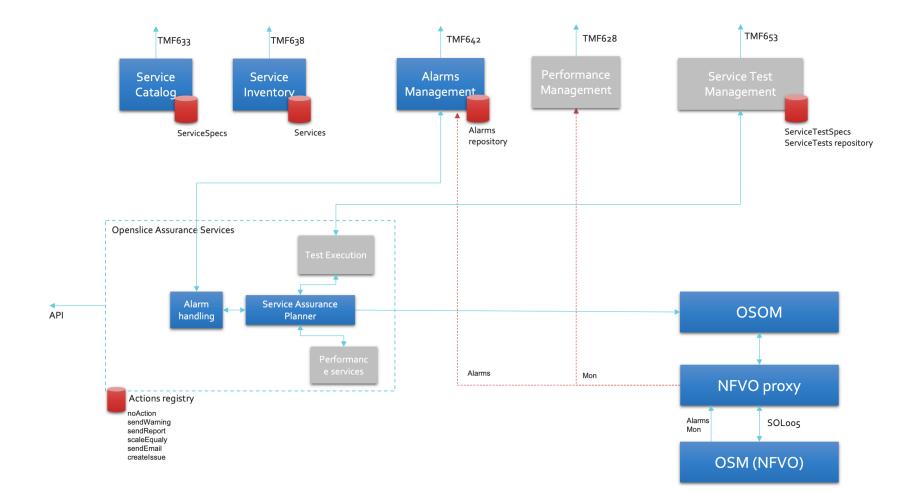
oC#2 service prototypes running in OpenSlice

pporting Services allocated	with Service			^
tive ZSM_NS_F asourceFacingServiceSpecification	RFS			StartWode: AUTOMATICALLY_MANAGED, StartDate: 4 Mar 2021, 10:54 am (Local Time)
<pre>xtive ZSM_NS_SRV_GR esourceFacingServiceSpecification</pre>	RFS		OpenSlice	StartMode: AUTOMATICALLY_MANAGED, StartDate: 4 Mar 2021, 10:54 am (Local Time)
ctive ZSMP0C ustomerFacingServiceSpecification	CFS		inventory	StartMode: AUTOMATICALLY_MANAGED, StartDate: 4 Mar 2021, 10:54 am (Local Time)
ctive ZSM_NS_SRV esourceFacingServiceSpecification	RFS	J		StartMode: AUTOMATICALLY_MANAGED, StartDate: 4 Mar 2021, 10:54 am (Local Time)

Service Overview A	nd Managemer	nt
Overview and Manage ZSM_NS_F serv ResourceFacIngServiceSpecification	rice	
B Service created at 04/03/2021, 10:54 (L	ocal Time)	
Main Properties	Characteristic	Value (Alias)
Service Characteristics	characteristic	Value (viiidas) {"InsName": "Service_Order, a074ddf1-405f-424c-a506-a927374275f7", "ssh_keys": ["], "insdid": "39365667-1c30-4021-
Supporting Resources	APPLY CONFIG	addi 40. Saddota (* Vinekcountid") (disklaske2439.805 Solidid Tased) "inf" (Timetherwinkneit") "indu" (Tid" Thaoroyu, Vininefaiti ("Timether "Timetherwine") (Solidid Tased) "inf" (Timetherwinkneit") "indu" name "108.400 Timether") (Timetherwinkneiter") ("Vininetherwine") (Solidid Tased) (Timetherwinkneit") (Timetherwinkneit") address") (2014) (Solidid Tased) (Timetherwinkneit") ("Mid Context) (Solidid Tased) (Timetherwinkneit") address") (2014) (Solidid Tased) (Timetherwinkneit") (Solidid Context) (Timetherwinkneit") (Timetherwinkneit") address") (Timetherwinkneiter") (Timetherwinkneit") (Solidid Context) (Timetherwinkneit") (Timetherwinkneit") (Timetherwinkneit") (Timetherwinkneiter") (Timetherwinkneit") (Solidid Context) (Timetherwinkneit") (Solidid Context) (Timetherwinkneit") (Timetherwinkneit") (Timetherwinkneiter") (Timetherwinkneit") (Timetherwinkneit") (Timetherwinkneit") (Timetherwinkneit) (Timetherwinkneiter") (Timetherwinkneit") (Timetherwinkneit") (Timetherwinkneit") (Timetherwinkneit) (Timetherwinkneit) (Timetherwinkneit") (Timetherwinkneit") (Timetherwinkneit) (Timetherwinkneit) (Timetherwinkneit) (Timetherwinkneit) (Timetherwinkneit) (Timether
	CONFIG	(Insidi 13355567) (12)-4221 4031 402 144/0418* (Insidi 14) (12) (22) 4622 - 4235 4005 540847 (14) (12) (Insidi 14) (14) (Insidi 14) (
	ConfigStatus	configured
	ConstituentVnfrlps	L8_WR119210.044[150140.155237192.1010.46192.168.28.2] Wserver_WR2192.10.10.68[192.101.068,192.168.28.10,192.168.20.5] L8_WR2192.10.1054[152168.20.2192.1010.5912168.28.2] Wserver_WR415.10.1071[192.10071192.108245.20.15421.51.0154.252.16]
	DeploymentRequestID	102
	Instanceld	c81b8ae0-e06a-45b8-bbd6-c5efa17339a2
	MemberVNFIndex_1	1 (LB_VNF)
Oopenslice Services Marketpla	ce Manage Services * Ma	nage Entities - 🖸 🏋 Order List admin -
	MemberVNFIndex_3	3 (LB_VNF)
	MemberVNFIndex_4	4 (Wserver2_VNP)
	NSDID	55 (id)
	ObMANOprovider_Name	OSM EIGHTctranoris
	OnBoardingStatus	ONBOARDED
	OperationalStatus	running
	PackageLocation	http://openslice-portalapi:13000/osapi/packages/fcaad3fd-3eae-4c82-8efb-baefa7a5c18d/NS - F.tar.gz (PackageLocation)
	PackagingFormat	OSMvEIGHT (PackagingFormat)
	SSHKEY	
	Status	RUNNING
	Vendor	(Vendor)
		📓 Edit Senice Characteristics

OpenSlice – service assurance





© ETSI

OpenSlice – service assurance



PoC#2: alarm management

larms							💼 Create Test Alarm
w and manage alarms r	aised by the system o	components					Create rest Alam
Apply Filter							
Source System	Severity	Ack State	State	Туре	Probable Cause	Raised Time (Local Time)	Actions
mano-client-service	• critical	unacknowledged	raised	qualityOfServiceAlarm	thresholdCrossed	5 Mar 2021, 15:14:17	
mano-client-service	 critical 	unacknowledged	raised	qualityOfServiceAlarm	thresholdCrossed	5 Mar 2021, 15:14:12	2
mano-client-service	• warning	unacknowledged	raised	qualityOfServiceAlarm	thresholdCrossed	5 Mar 2021, 15:14:08	2
mano-client-service	 critical 	unacknowledged	raised	qualityOfServiceAlarm	thresholdCrossed	5 Mar 2021, 15:14:08	C

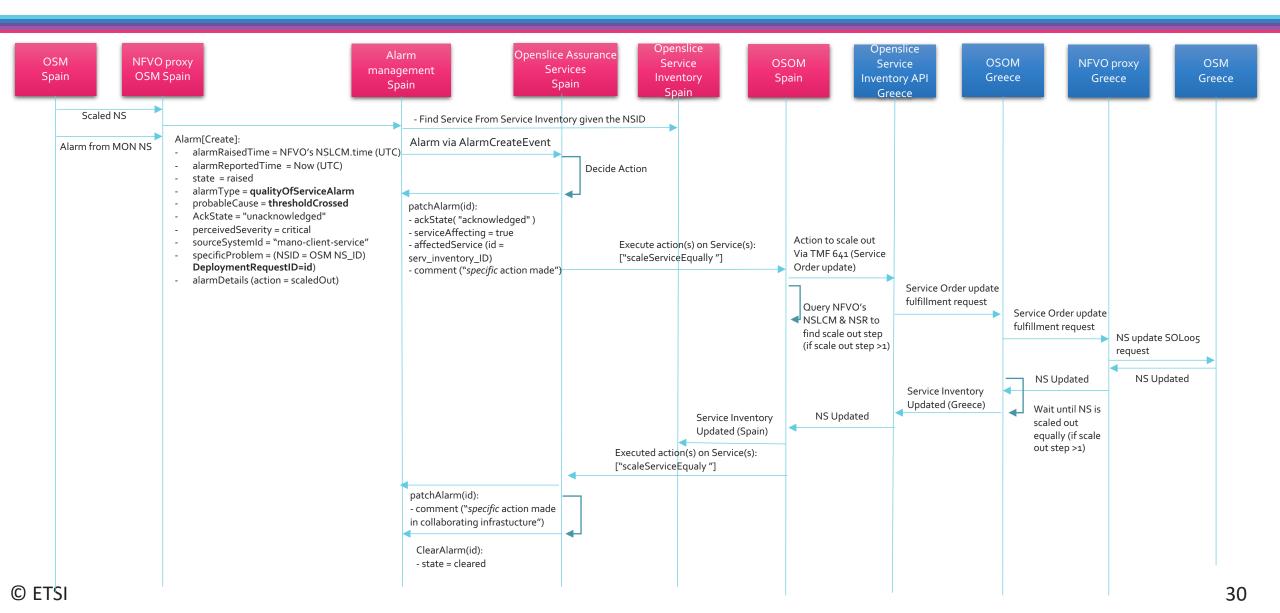
PoC#2: policy design

ain action rule properties					
me itical Alerts on mano-client-service	Scope mano-cl	lient-service		Openslice Event Type AlarmCreateEvent	
scription igger equal scale operation on crit	ical alarm from mano-client-:	service, which indicates resource	threshold cr	ossing	
anditions					
ant Attribute Name	Comparison Operator	Event Attribute Value		Boolean Operator	
obableCause .	Equals .	 thresholdCrossed 	*	AND 👻	×
ent Attribute Name	Comparison Operator	Event Attribute Value			
erceivedSeverity	Equals .	 critical 	*	Boolean Operator 🛛 🔻	×
		Add Action Rule Condition			

PoC#2: policy management

Manage Services 👻 Manage Entities 👻 Monitoring 👻	0) <u></u>	Order List
	📋 Create New	Action R
civeo upor alarm delections		
Description	Event Type	Actions
Trigger equal scale operation on critical alarm from mano-client-service, which indicates resource threshold crossing	AlarmCreateEvent	2
	ecked upon alarm detections Description	ecked upon alarm detections Description Event Type

PoC#2: cross-domain orchestration (steps 7-11)



Open Source