



Kubernetes Workshop

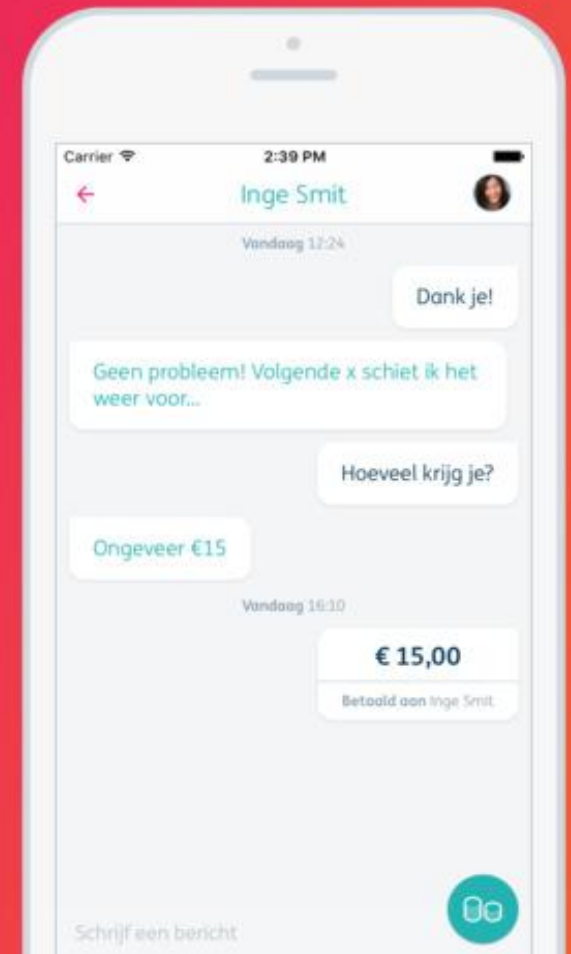
Abdullahi Egal | 1 juni 2016

Part 5: Kubernetes at Twyp

Twyp

Twyp is a Peer to Peer payment app that allows you to:

- Transfer money from your mobile phone directly to another mobile phone
- Near real-time pan-European money transfers
- No need for an ING bank account
- Super simple onboarding



Our history before Kubernetes



A stylized atomic symbol logo consisting of three intersecting elliptical orbits in a light gray color, with a small green triangle at the center.

PROJECT ATOMIC

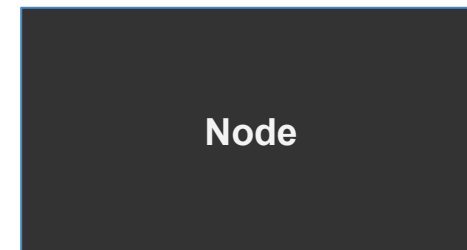
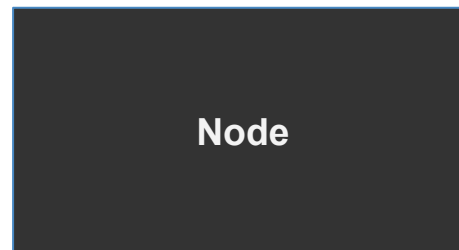
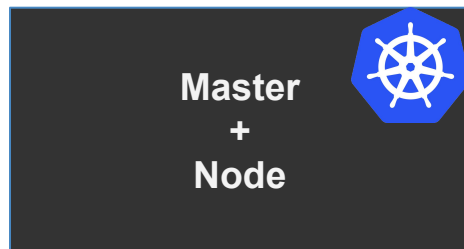
With Twyp we have

- 4 Kubernetes clusters for DTAP
- Over 20 different microservices deployed on each cluster
- More than 250K registred users, making use of the cluster
- A kubernetes cluster running in production for more than 6 months
- 2 Active-Active datacenters



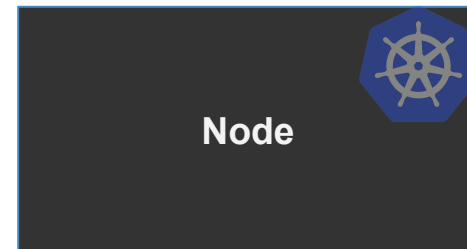
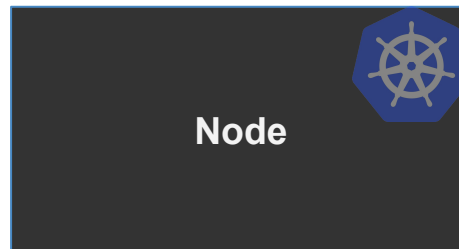
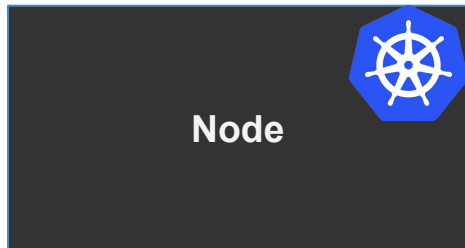
Kubernetes at Twyp: Dev environment

- The Development environment is a Kubernetes cluster that was setup by us.
- The whole environment is scripted and uses CentOS + Project Atomic
- The cluster has 3 nodes.
- The kubernetes master runs on a Kubernetes node (do not do this in Production).



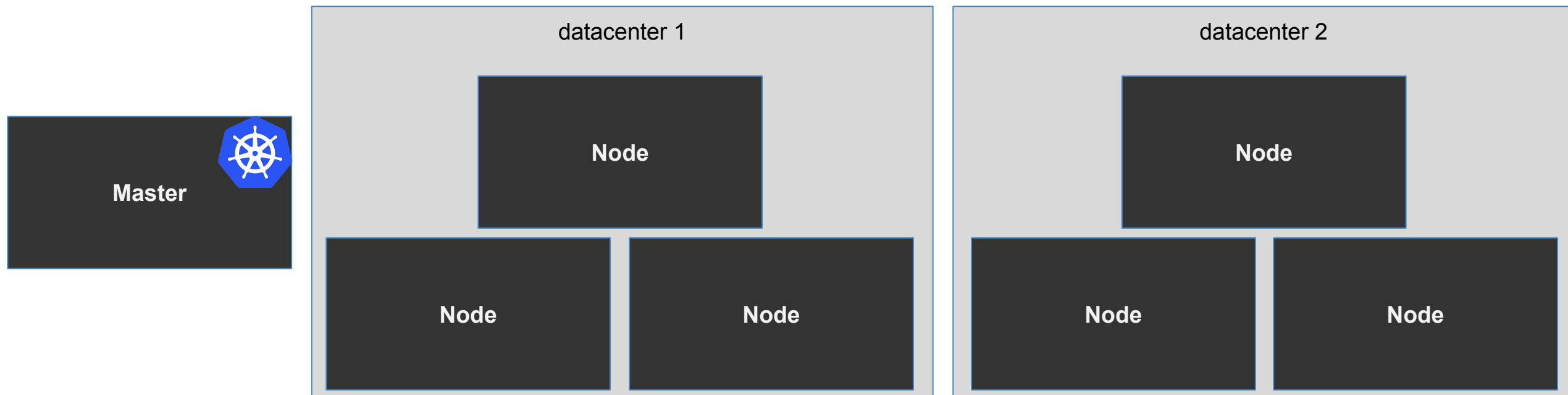
Kubernetes at Twyp: Test environment

- The Test environment is a Kubernetes cluster that was hosted by our hosting provider -> ISP.
- The cluster has 3 nodes.
- The kubernetes master floats between hosts and acts as a failover.



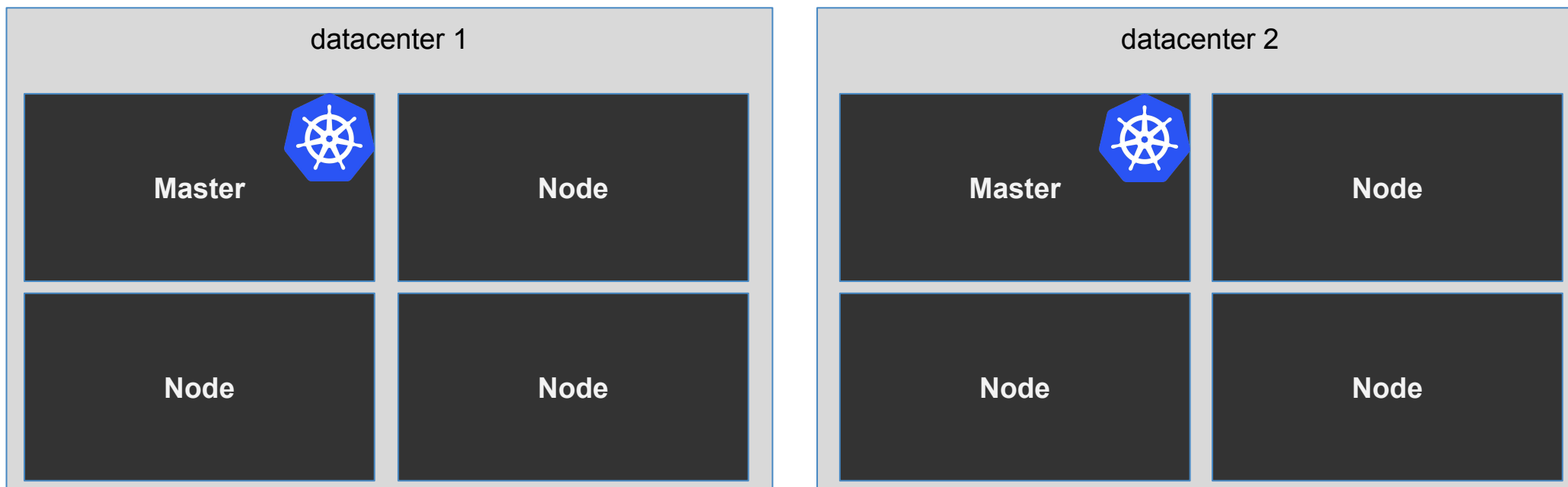
Kubernetes at Twyp: Acceptance environment

- The cluster has 6 nodes.
- The cluster runs on multiple active-active datacenters
- The kubernetes master runs on a separate host.



Kubernetes at Twyp: Production environment

- There are 2 Kubernetes masters (Active-Passive).



The Kubernetes cluster of Twyp has

- Multiple dashboards to control Kubernetes
- Anti affinity
- Extra security measures (SeLinux, Proxies, etc)
- F5 Load balancer to access the Kubernetes services



kubernetes

Pods overview

Replication controller

Event overview

Elasticsearch

DeadletterQueue Middleware

DeadletterQueue Chat

Analytics

Export

All health checks

Service name	Status	Ready	Restarts	Healthcheck	Pod IP	Node	Action
access-control-70-dc1-m16q5	Running	true (access-control-70-dc1)	0 (27 days ago)	OK	10.20.90.9	lxa150e.srv.pl.ing.net	Restart
access-control-70-dc2-grbr7	Running	true (access-control-70-dc2)	0 (27 days ago)	OK	10.20.14.10	lxa150h.srv.pl.ing.net	Restart
addressbook-307-dc1-k2fbg	Running	true (addressbook-307-dc1)	0 (about a month ago)	OK	10.20.23.6	lxa150g.srv.pl.ing.net	Restart
addressbook-307-dc2-apfs1	Running	true (addressbook-307-dc2)	0 (about a month ago)	OK	10.20.7.6	lxa150f.srv.pl.ing.net	Restart
bi-grafana-63-f29nt	Running	true (bi-grafana-63)	0 (about a month ago)	N/A	10.20.7.7	lxa150f.srv.pl.ing.net	Restart
business-intelligence-99-r-jzrye	Running	true (business-intelligence-99-r)	0 (about a month ago)	OK	10.20.7.14	lxa150f.srv.pl.ing.net	Restart
		true (spark-master)	0 (about a month ago)				
		true (spark-worker)	0 (about a month ago)				
business-intelligence-lesa-biep-75-dc1-uaxyw	Running	true (business-intelligence-lesa-biep-75-dc1)	3 (18 days ago)	OK	10.20.90.4	lxa150e.srv.pl.ing.net	Restart
business-intelligence-lesa-biep-75-dc2-q4o8x	Running	true (business-intelligence-lesa-biep-75-dc2)	3 (18 days ago)	OK	10.20.7.8	lxa150f.srv.pl.ing.net	Restart
chat-archive-361-dc1-kmhna	Running	true (chat-archive-361-dc1)	0 (27 days ago)	OK	10.20.86.8	lxa150i.srv.pl.ing.net	Restart
chat-archive-361-dc2-m7rv9	Running	true (chat-archive-361-dc2)	0 (27 days ago)	OK	10.20.7.10	lxa150f.srv.pl.ing.net	Restart
chat-integration-361-dc1-nrkof	Running	true (chat-integration-361-dc1)	0 (27 days ago)	OK	10.20.86.9	lxa150i.srv.pl.ing.net	Restart
chat-integration-361-dc2-x8vog	Running	true (chat-integration-361-dc2)	0 (27 days ago)	OK	10.20.7.13	lxa150f.srv.pl.ing.net	Restart
chat-session-361-dc1-em5v9	Running	true (chat-session-361-dc1)	0 (27 days ago)	OK	10.20.90.11	lxa150e.srv.pl.ing.net	Restart
chat-session-361-dc2-ui9c2	Running	true (chat-session-361-dc2)	0 (27 days ago)	OK	10.20.39.6	lxa150j.srv.pl.ing.net	Restart
chat-ws-361-dc1-22mq7	Running	true (chat-ws-361-dc1)	0 (27 days ago)	OK	10.20.90.7	lxa150e.srv.pl.ing.net	Restart
chat-ws-361-dc1-ijfnm	Running	true (chat-ws-361-dc1)	1 (25 days ago)	OK	10.20.86.7	lxa150i.srv.pl.ing.net	Restart
chat-ws-361-dc2-kdi8n	Running	true (chat-ws-361-dc2)	0 (27 days ago)	OK	10.20.14.4	lxa150h.srv.pl.ing.net	Restart
chat-ws-361-dc2-klx18	Running	true (chat-ws-361-dc2)	1 (25 days ago)	OK	10.20.7.11	lxa150f.srv.pl.ing.net	Restart

Pods overview

Replication controller

Event overview

Elasticsearch

DeadletterQueue Middleware

DeadletterQueue Chat

Analytics

Export

Node overview

Node name	Node IP	Status	Reason	Last heartbeat
lxa150e.srv.pl.ing.net	10.111.43.34	Ready: True	KubeletReady	about an hour ago
	10.111.43.34			
lxa150f.srv.pl.ing.net	10.111.43.35	Ready: True	KubeletReady	about an hour ago
	10.111.43.35			
lxa150g.srv.pl.ing.net	10.111.43.36	Ready: True	KubeletReady	about an hour ago
	10.111.43.36			
lxa150h.srv.pl.ing.net	10.111.43.37	Ready: True	KubeletReady	about an hour ago
	10.111.43.37			
lxa150i.srv.pl.ing.net	10.111.43.38	Ready: True	KubeletReady	about an hour ago
	10.111.43.38			
lxa150j.srv.pl.ing.net	10.111.43.39	Ready: True	KubeletReady	about an hour ago
	10.111.43.39			

Replication controller overview

RC Name	Version	Labels	Repplicas (current / desired)	Change replicas
access-control	70	cassandra - cassandra dc - 1 name - access-control rabbitmq - middleware type - backend version - 70	1 / 1	- 1 +
access-control	70	cassandra - cassandra dc - 2 name - access-control rabbitmq - middleware type - backend version - 70	1 / 1	- 1 +
addressbook	307	dc - 1 name - addressbook postgresql - fontvella rabbitmq - middleware type - backend version - 307	1 / 1	- 1 +
addressbook	307	dc - 2 name - addressbook postgresql - fontvella rabbitmq - middleware type - backend version - 307	1 / 1	- 1 +
		name - bi-grafana postgresql - fontvella type - backend version - 63	1 / 1	- 1 +

Pods overview

Replication controller

Event overview

Elasticsearch

DeadletterQueue Middleware

DeadletterQueue Chat

Analytics

Export

Event overview

Kind	Action	Message	First occurrence	Last occurrence	Node
(Pod) elk-108-r-mki8y	FailedSync (count: 1)	Error syncing pod, skipping: API error (500): Cannot start container 64e25dbb105dfd171aaa2d8056b46e441bcedc190b174b1fcf1016d94a5ca10a: failed to create endpoint k8s_POD.51d68701_elk-108-r-mki8y_default_f14d6f4e-2635-11e6-b6b5-005056af5985_6cbc39c8 on network bridge: Bind for 0.0.0.0:9300 failed: port is already allocated	less than a minute ago	less than a minute ago	lxa1502.srv.pl.ing.net
(Pod) elk-108-r-mki8y	Pulled (count: 870)	Container image "kubernetes/pause" already present on machine	about 2 hours ago	less than a minute ago	lxa1502.srv.pl.ing.net
(Pod) elk-108-r-mki8y	Created (count: 1)	Created with docker id 64e25dbb105d	less than a minute ago	less than a minute ago	lxa1502.srv.pl.ing.net
(Pod) elk-108-r-mki8y	Failed (count: 1)	Failed to start with docker id 64e25dbb105d with error: API error (500): Cannot start container 64e25dbb105dfd171aaa2d8056b46e441bcedc190b174b1fcf1016d94a5ca10a: failed to create endpoint k8s_POD.51d68701_elk-108-r-mki8y_default_f14d6f4e-2635-11e6-b6b5-005056af5985_6cbc39c8 on network bridge: Bind for 0.0.0.0:9300 failed: port is already allocated	less than a minute ago	less than a minute ago	lxa1502.srv.pl.ing.net
(Pod) elk-108-r-mki8y	Created (count: 1)	Created with docker id a42f53183f6d	less than a minute ago	less than a minute ago	lxa1502.srv.pl.ing.net
(Pod) elk-108-r-mki8y	Failed (count: 1)	Failed to start with docker id a42f53183f6d with error: API error (500): Cannot start container a42f53183f6d1f28587b34024197eb2f04d139ef0db6b45eaddab17a8a678835: failed to create endpoint k8s_POD.51d68701_elk-108-r-mki8y_default_f14d6f4e-2635-11e6-b6b5-005056af5985_de88eac0 on network bridge: Bind for 0.0.0.0:9300 failed: port is already allocated	less than a minute ago	less than a minute ago	lxa1502.srv.pl.ing.net
(Pod) elk-108-r-mki8y	FailedSync (count: 1)	Error syncing pod, skipping: API error (500): Cannot start container a42f53183f6d1f28587b34024197eb2f04d139ef0db6b45eaddab17a8a678835: failed to create endpoint k8s_POD.51d68701_elk-108-r-mki8y_default_f14d6f4e-2635-11e6-b6b5-005056af5985_de88eac0 on network bridge: Bind for 0.0.0.0:9300 failed: port is already allocated	less than a minute ago	less than a minute ago	lxa1502.srv.pl.ing.net
(Pod) elk-108-r-mki8y	FailedSync (count: 1)	Error syncing pod, skipping: API error (500): Cannot start container 4db284998e3a404b8ef7a07199c43a69f2d225ec5f13a201bf4e38f512918: failed to create endpoint k8s_POD.51d68701_elk-108-r-mki8y_default_f14d6f4e-2635-11e6-b6b5-005056af5985_1c621659 on network bridge: Bind for 0.0.0.0:9300 failed: port is already allocated	less than a minute ago	less than a minute ago	lxa1502.srv.pl.ing.net

Improvements for Twyp

- Make use of Kubernetes 1.2 features
 - Ingress
 - Deployments
 - Automatic scaling
 - And more
- Open source the Twyp deployment dashboard
- Decrease the number of clusters / environments (Testing in production).





You should now know most features of Kubernetes

Final tips

- Start with Kubernetes and get more experience with it.
- There is a Kubernetes slack channel that provides a place to ask questions: <https://kubernetes.slack.com>
- Kubernetes is rapidly changing, so keep an eye out for new features.
- Look for opportunities to use Kubernetes at your project





We're done, Thanks for participating