Applications Active/Active

Using PATHWAY ACS

Jan Uildriks, 29 Apr 2015

Rabobank

Agenda

- Rabobank
- Our NonStop environment
- Goals
- Strategy
- Detailed implementations
- Conclusion

Rabobank Group global presence

Global

Mission
Rabobank is dedicated to being a leading customer-centric cooperative bank in the Netherlands and a leading food and agri bank in the world.

Globally active in 40 countries
8,8 million clients
440 foreign places of business
48,254 employees (in FTEs)

RaboDirect
Internet savings banks in Belgium, Germany, Ireland, Australia and New Zealand

The Netherlands

The Netherlands

Mission
In The Netherlands Rabobank is dedicated being a leading customer-centric cooperative bank.

- 7,6 million clients
- 2 million members
- 24/7 banking: online/mobile
- 113 local Rabobanks
- 547 branches
- 23,993 employees (in FTEs)

Rabobank and NonStop

- NonStop user since early 1980's
- 15 NonStop systems
  - Payment factory
  - ATM and POS terminals
  - Internet banking
  - Mobile banking

NonStop application servers

- Payment factory including ATM and POS
  - 2 x NB54010 (application + database server)
  - 2 x NB54004 (Atlas , large accounts)
- Internet and mobile banking apps backend
  - 2 x NB54006 (application server)
  - 2 x NB54006 (database server)
- HTTP(S) and MQ web services hub
  - 2 x NB54008
- Development / Test systems
  - 4 x NB5x004
- SAN Storage arrays
  - 4 x P9500 (production)
  - 1 x P9500 (test)

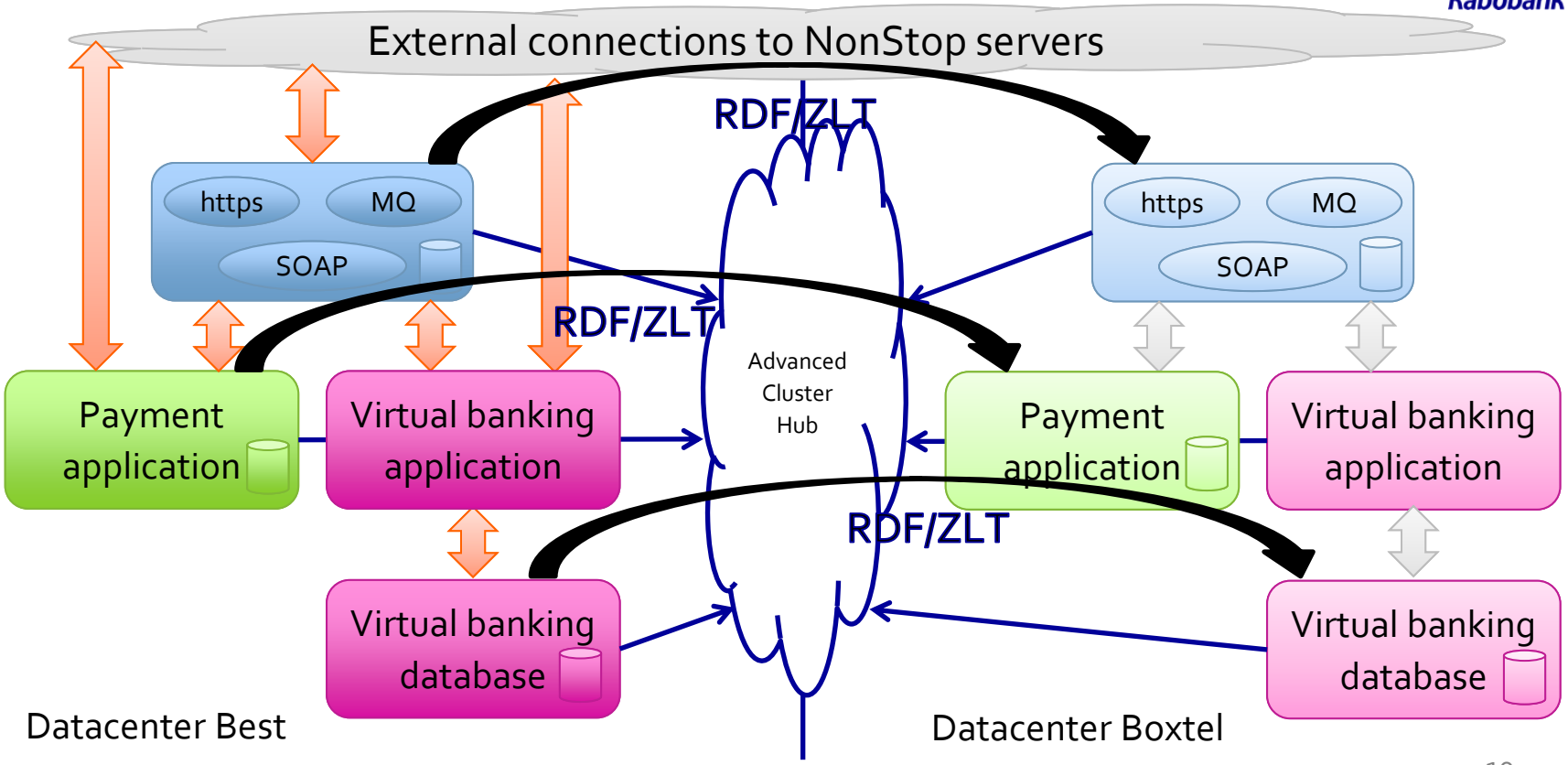
NonStop application figures

- Payment factory
  - 9.000.000 card holders
    - +100,000,000 transactions / month (POS and ATM)
    - Peak rate +350 card transaction / second
  - Account bookings
    - +250.000.000 transactions / month
    - Peak rate online 1,000 – 1,200 bookings / sec
    - Peak rate batch 10,000 bookings / sec
  - Account information retrieval for Internet and Mobile banking devices
    - Peak rate +300 Tps (account balances and transactions)

NonStop application figures

- Internet and mobile banking apps backend
  - 80,000,000 logins / month
  - 90,000,000 mandates / month
  - Backend database server TMF rates
    - Average 3,500 Tps
    - Peaks to 5,000 - 6,000Tps

System landscape before



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Application Active/Active

Using PATHWAY ACS domains

Goals

- Reduce implementation downtime
  - Reduction of 25 downtime implementations per year (-40 %)
  - Implementations during office hours
- Better utilization of our systems
  - Decreased impact of hardware failures
- Significantly shorter disaster recovery turnaround time (< 1 hour instead of 4-6 hours)

ACS implementation strategy

- Adopt current PATHMONs in ACS environment
  - Existing: `\P17.$TBXML` and `\P18.$TBXML`
  - ACS: `%TBXML:\P17.$TBXML:50, \P18.$TBXML:50`
  - Domain activation can only be performed offline
    - Existing pathmons must be down
  - Easy application strategy
- New ACS PATHMON environment
  - ACS: `%TBXML:\P17.$TBXML1:25,\P17.$TBXML2:25,\P18.$TBXML1:25,\P18.$TBXML2:25`
  - Domain activation online
    - No interference with other domains

Consequences ACS Pathmons

- MAXSERVERS no change
  - Still need to be able to run all the load
- NUMSTATIC back to percentage of domain
  - NUMSTATIC to 0 doesn't help to better load balance

ACS caveats

- Load versus link balancing
  - ACS does link balancing, like Pathway
  - Although ACSCTL suggests otherwise
    - `%JUPW: \T11.$JUPW1:50, \T12.$JUPW1:50`
  - Fast response servers (< 50 ms) tend to stay in first defined PATHMONs
- Re-balance after freeze/stop of one of PATHMONs
- Fragile activation process ACSCTL

Loadbalancing technics

- HTTP(s)
  - Network load balancer http(s) calls to both systems
- MQ
  - Separate queue-managers on both nodes
  - Usage of MQ-Clustering
    - Be aware of single cluster Xmit queue (throughput)
  - Recovery necessary in case of crash (persistent messages)
  - MQ-Client
    - In some situations best alternative to make MQ fully active-active

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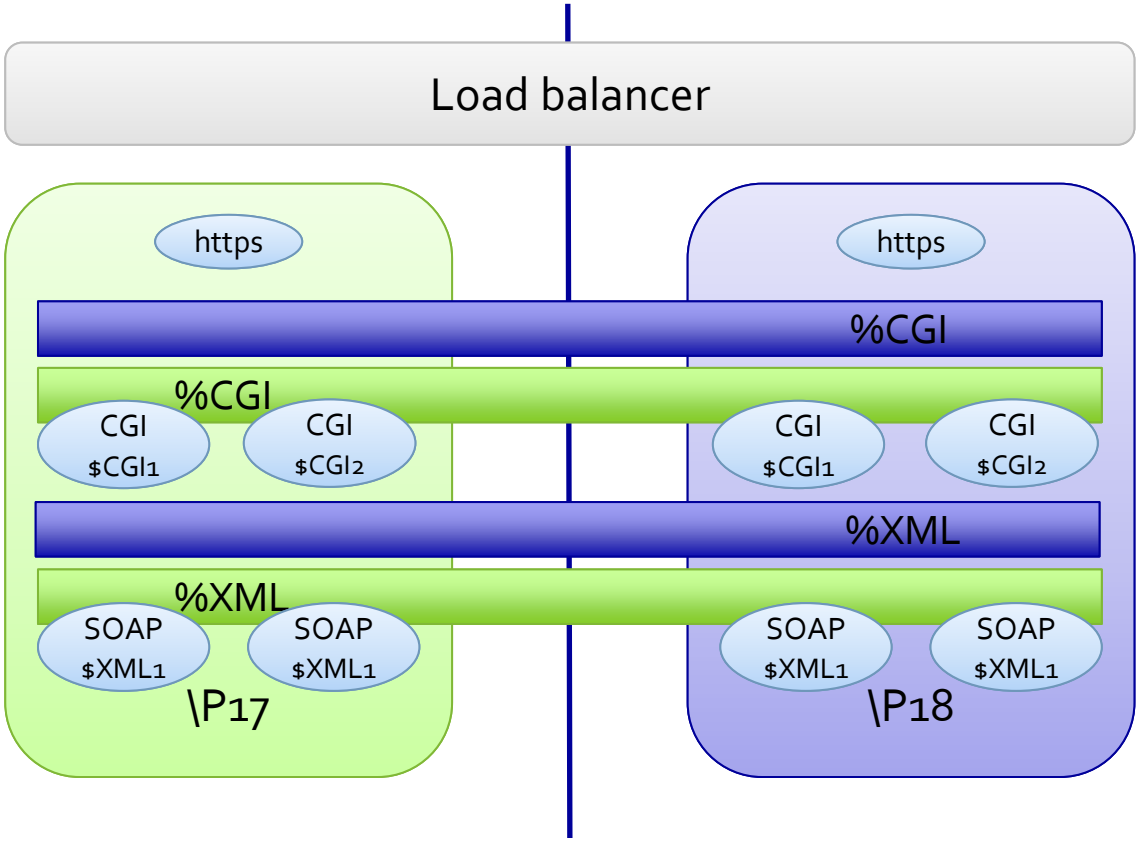
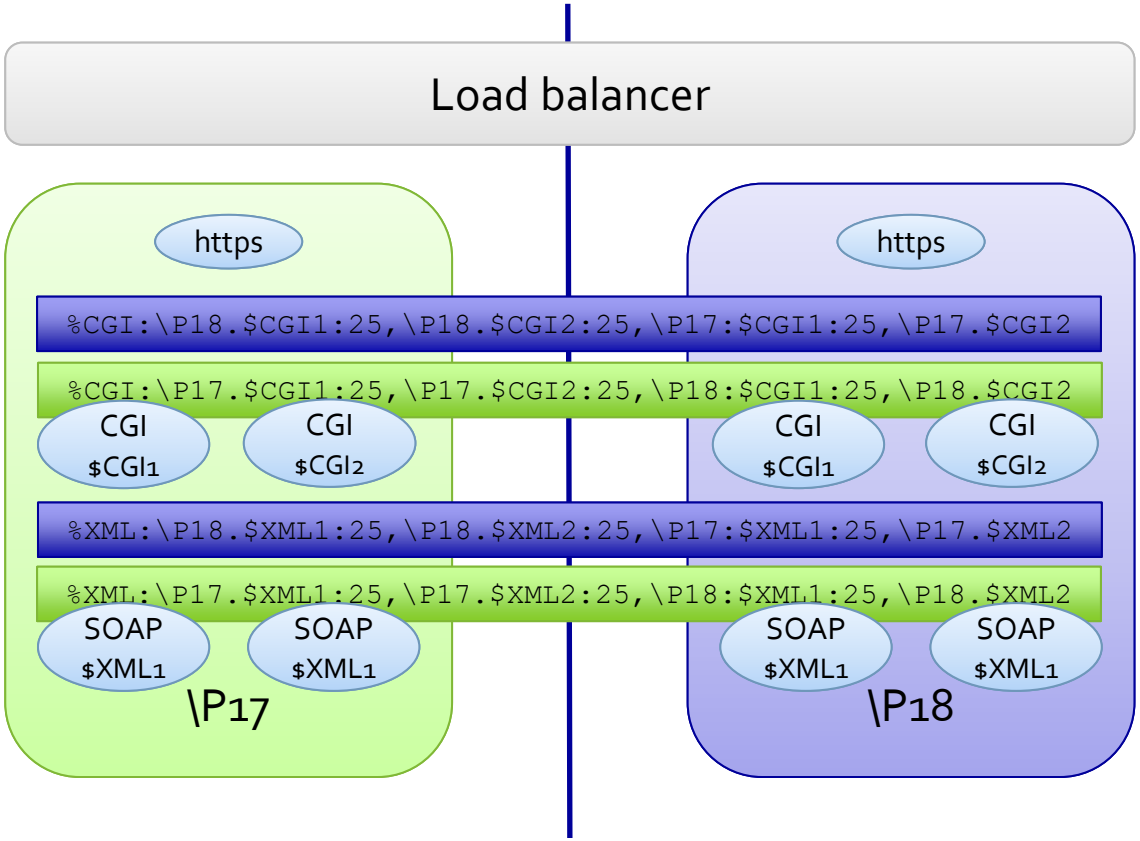
Detailed ACS implementation

ACS in combination with http(s) -> NonStop acting as server

Detailed ACS http(s) implementation



Detailed ACS http(s) implementation



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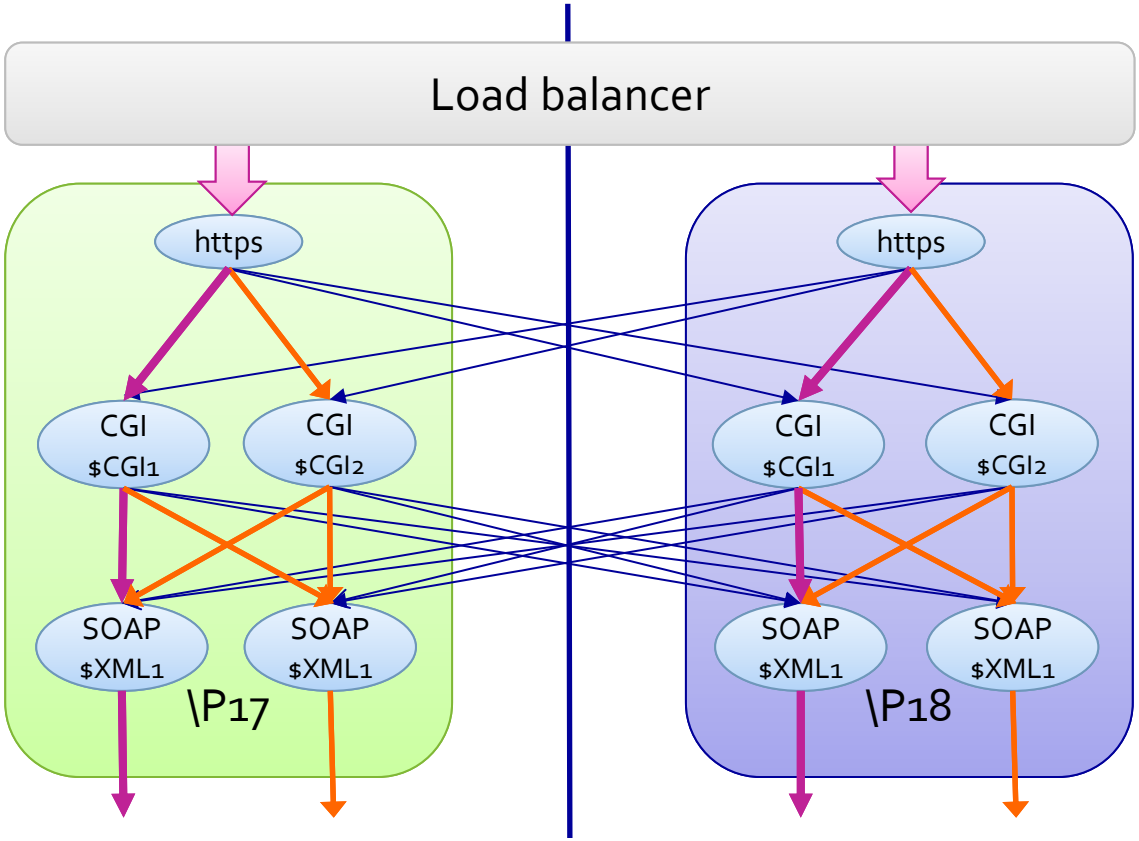
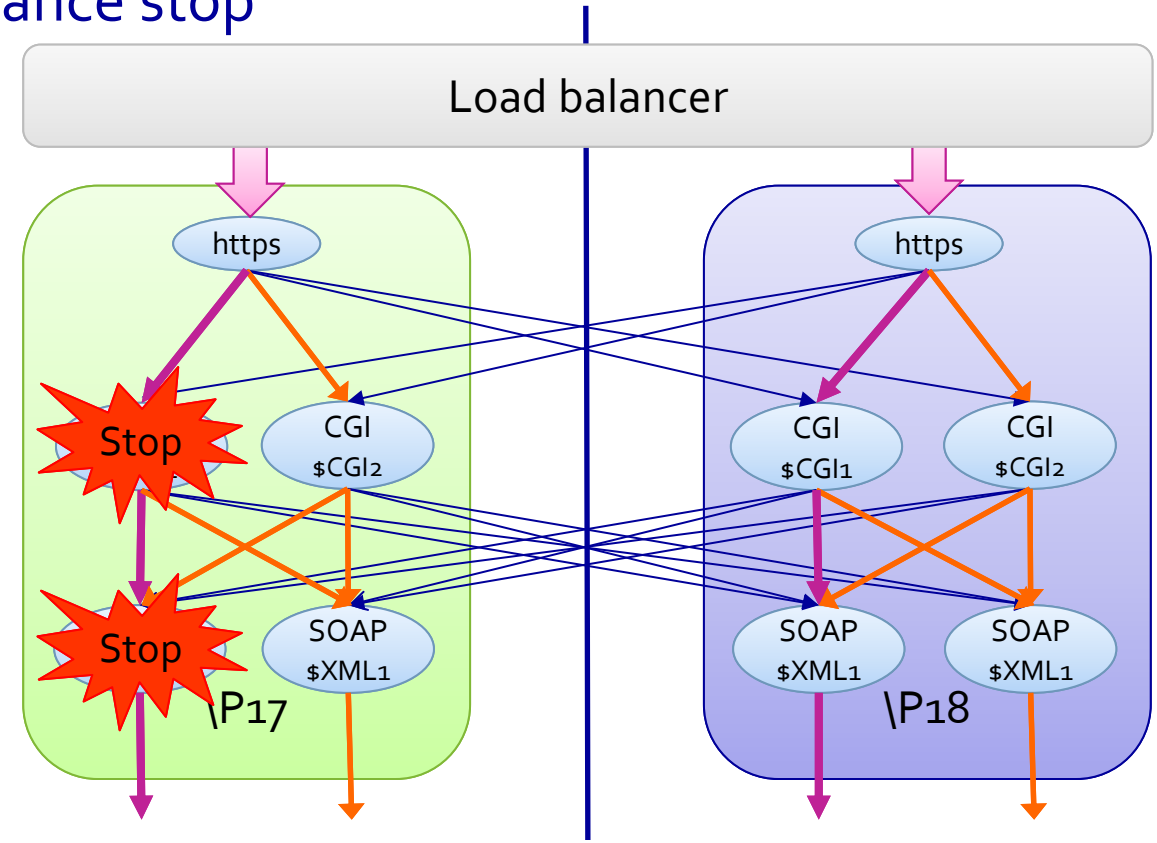


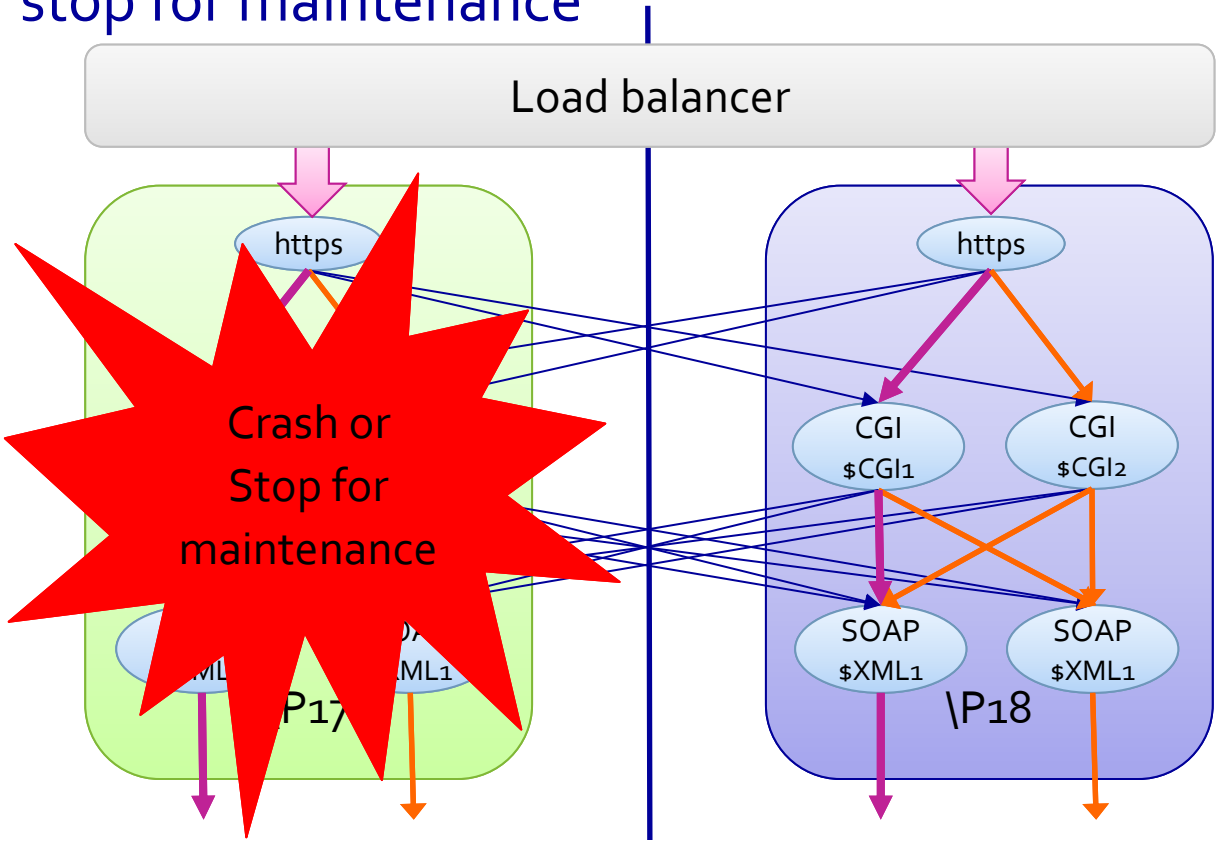
Detailed ACS http(s) implementation

Single instance stop



Detailed ACS http(s) implementation

Crash or stop for maintenance



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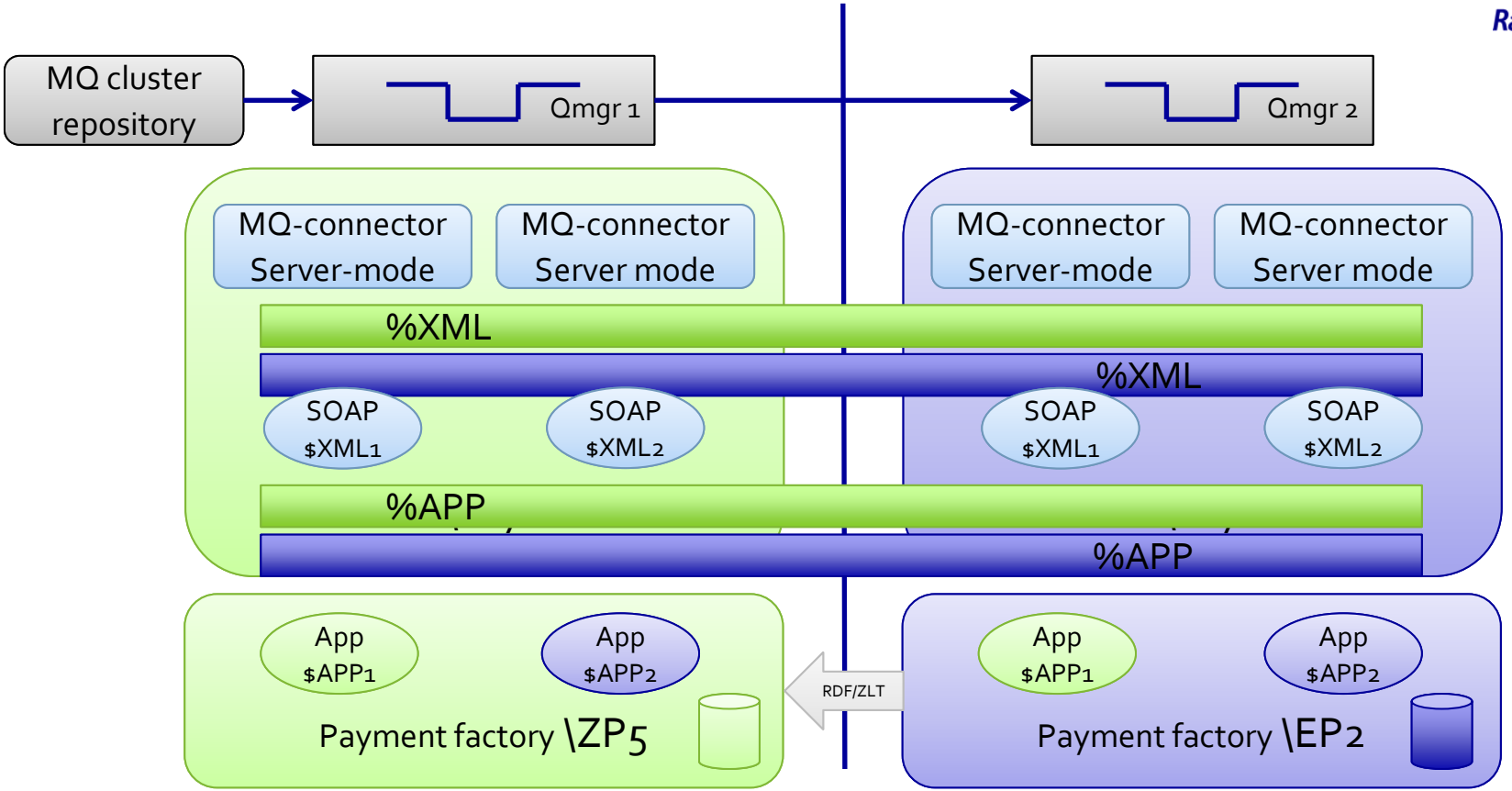
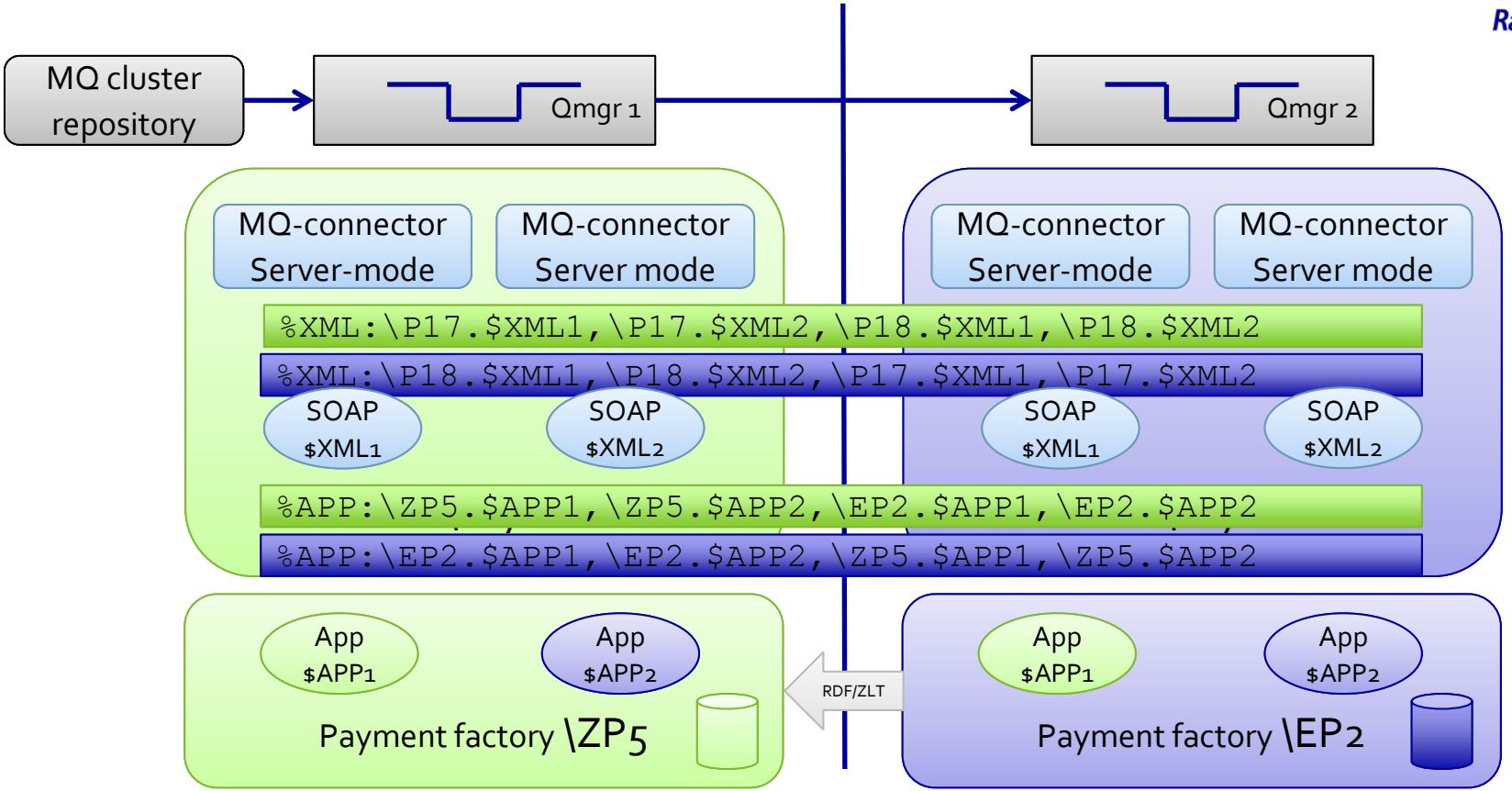
Detailed ACS implementation

ACS in combination with MQ clustering -> NonStop acting as server

Detailed ACS MQ implementation



Detailed ACS MQ implementation



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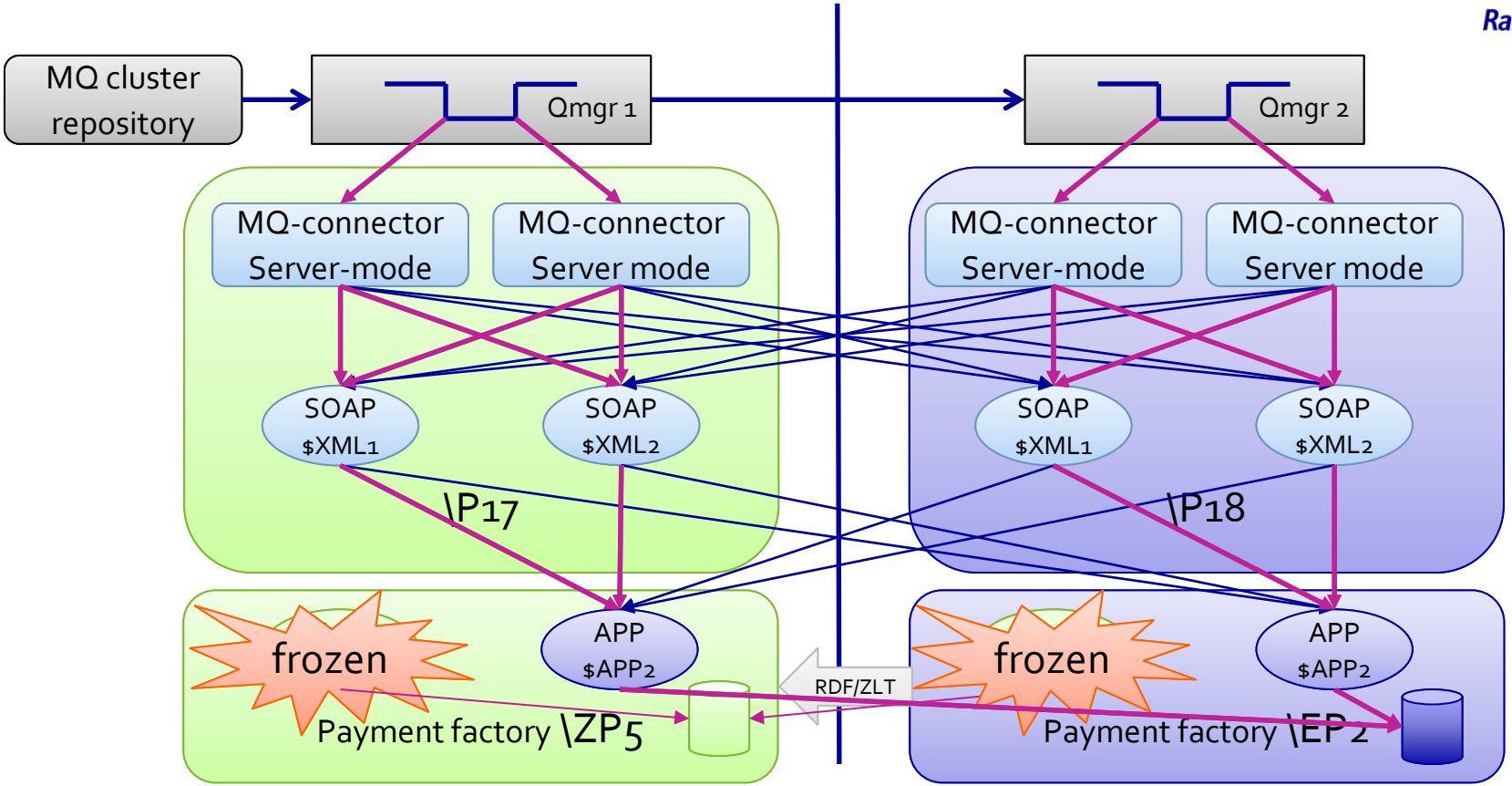
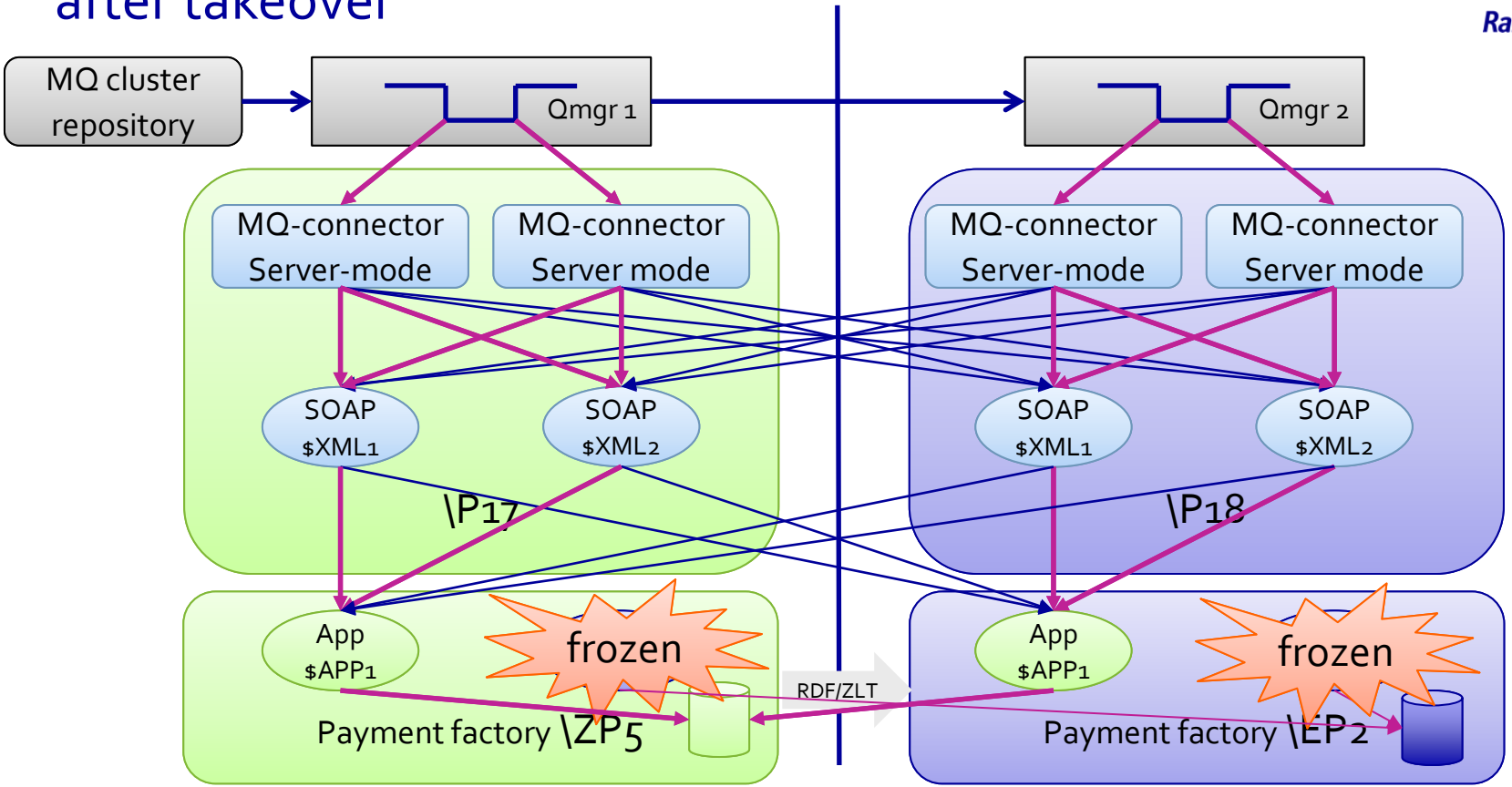


Detailed ACS MQ implementation

after takeover



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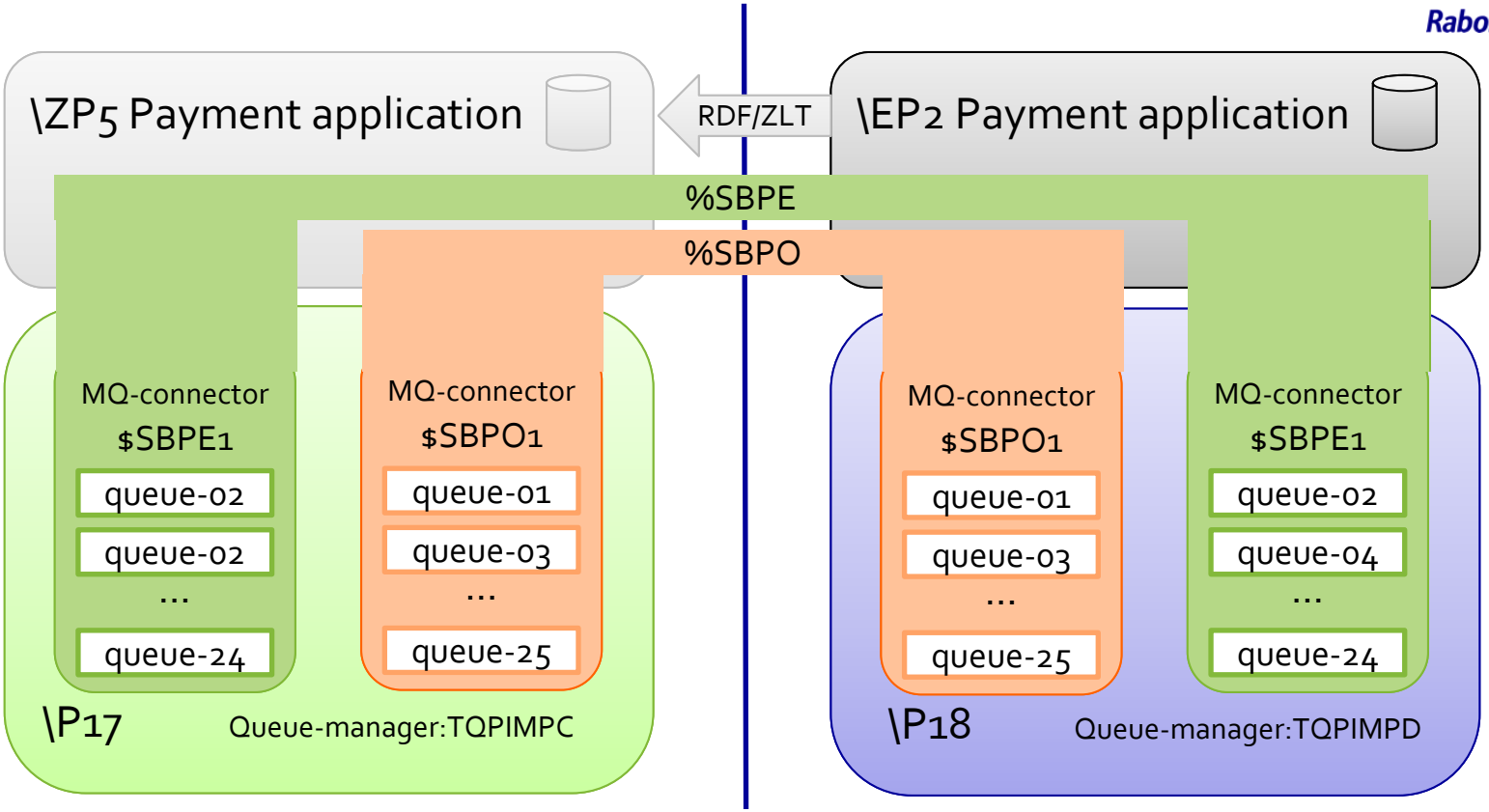
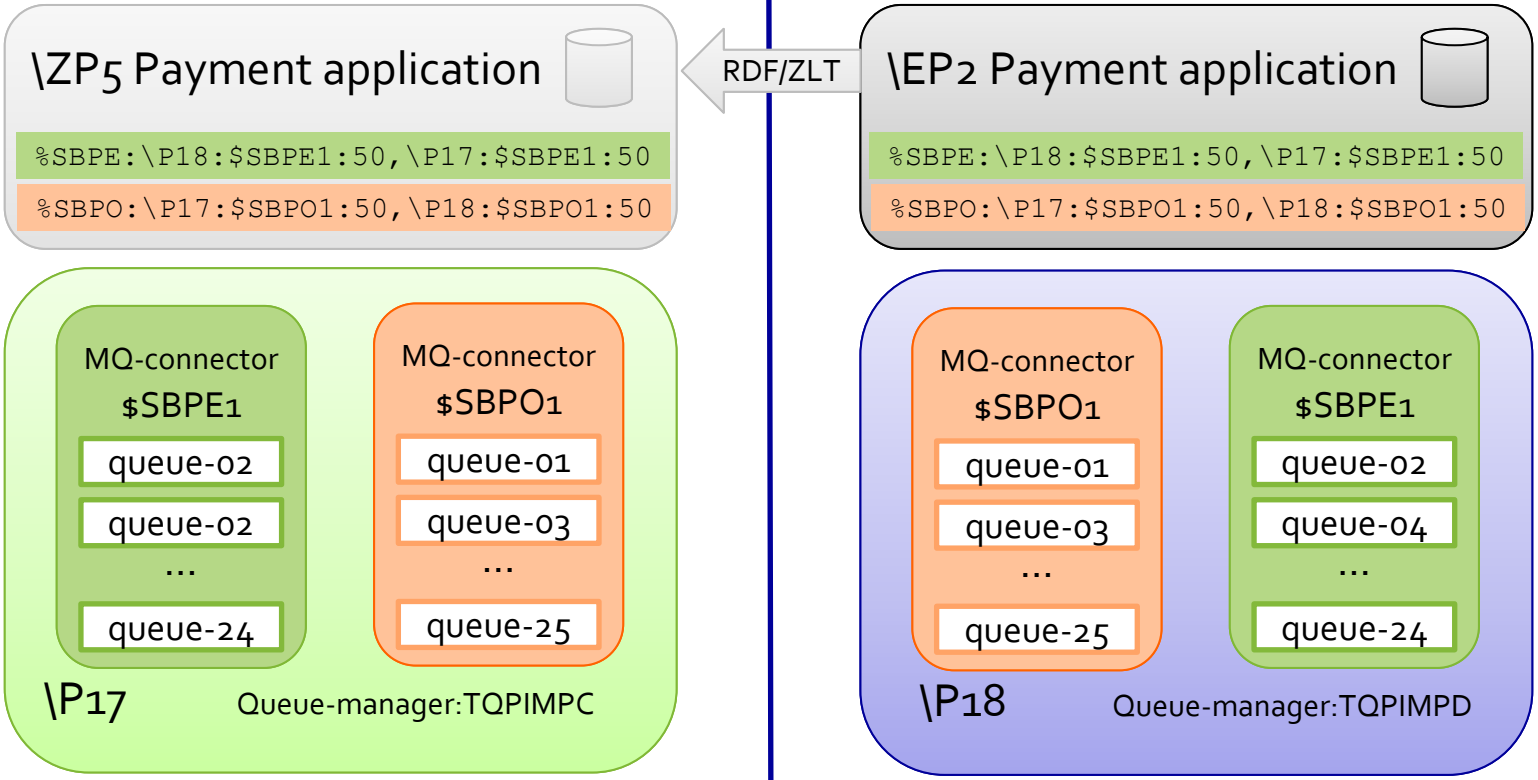
Detailed ACS implementation

ACS in combination with MQ -> NonStop acting as client

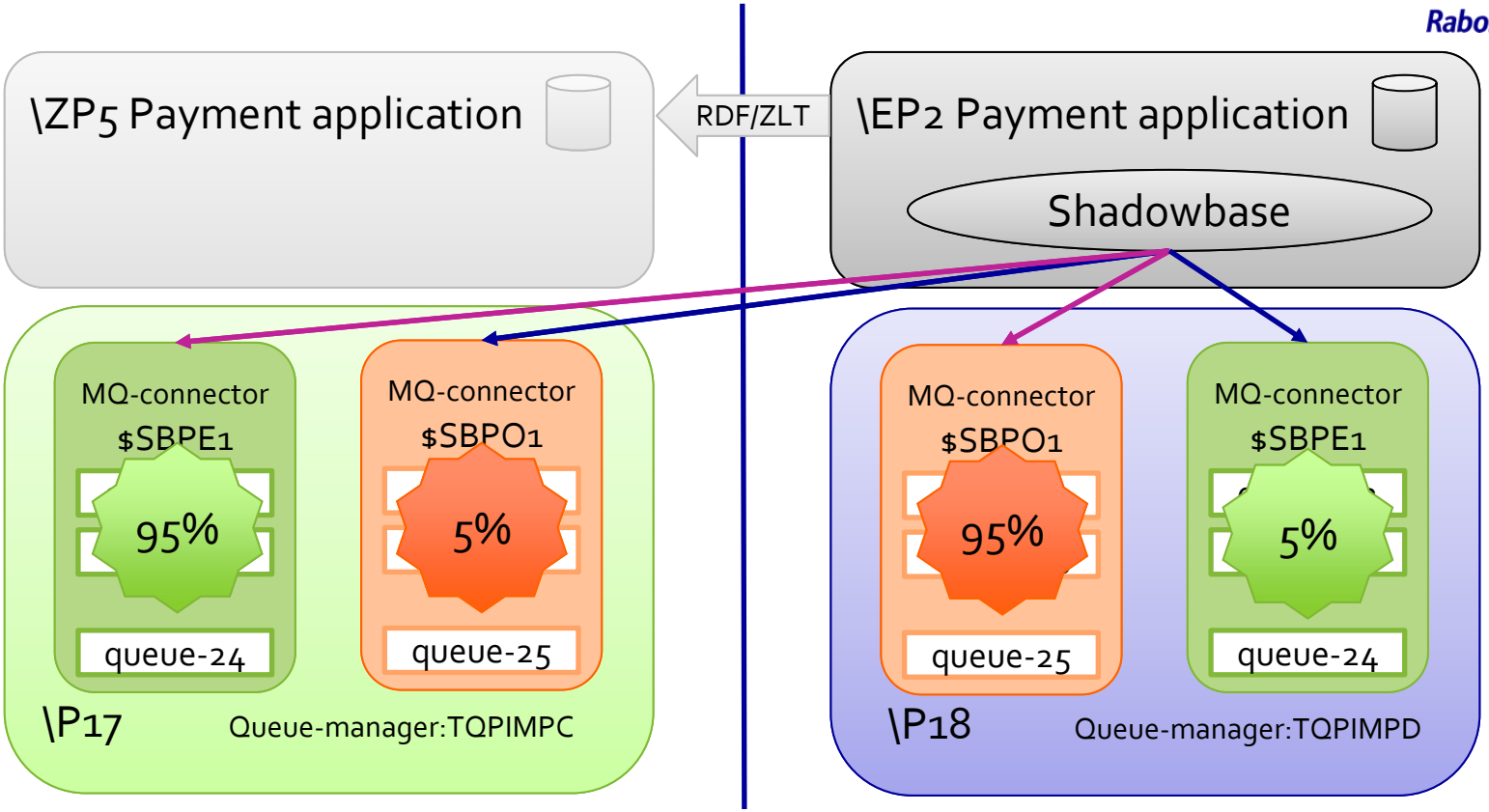
Detailed ACS MQ implementation



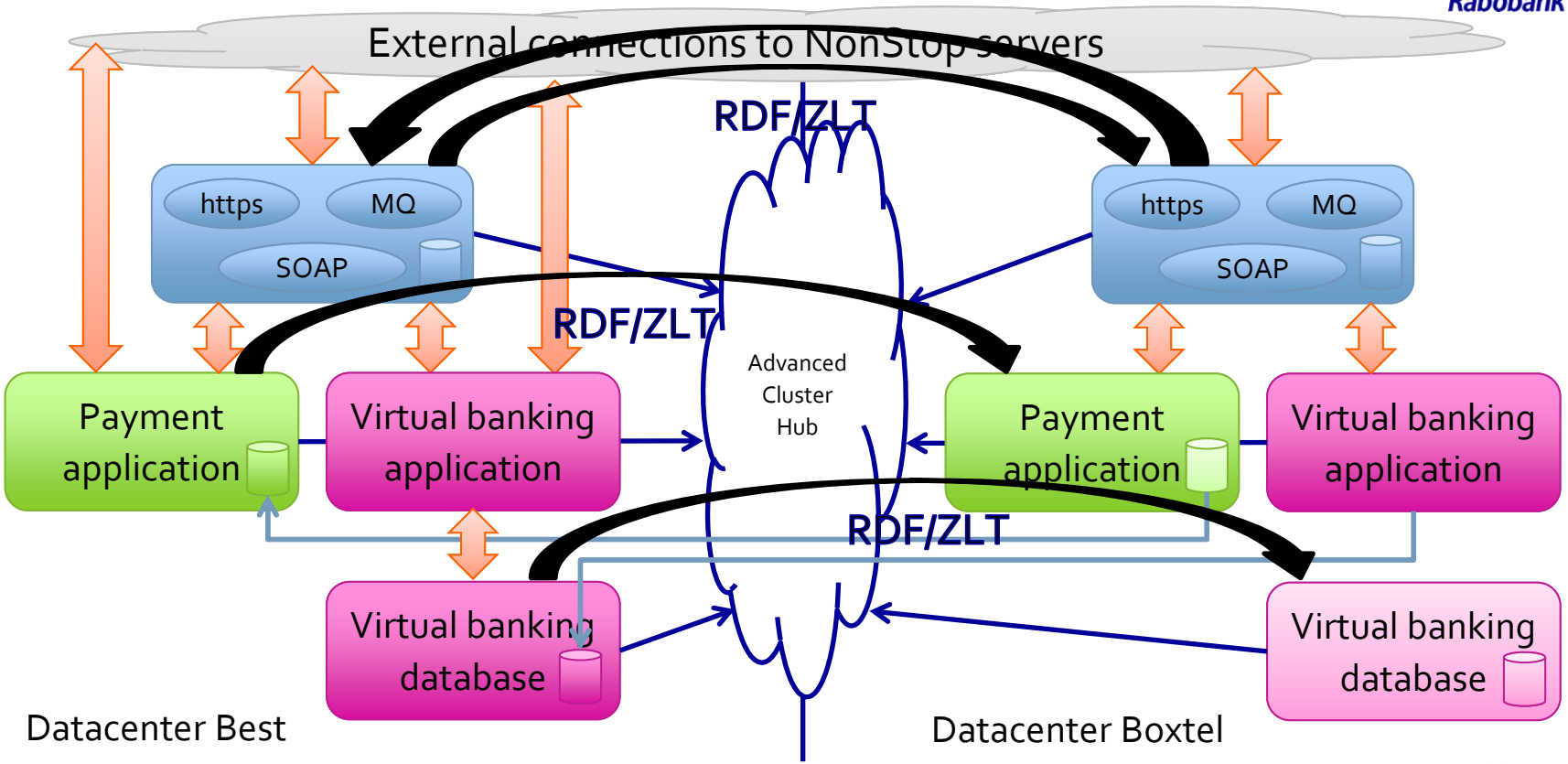
Detailed ACS MQ implementation



Detailed ACS MQ implementation



System landscape after



Project timing

- Project delivery in 3 phases
  1. Activation ACSCTL (multiple systems)
     - ACSCTL includes all domains (also featured domains)
     - Single SOAP framework instance
     - Show proof of operation
  2. Application moved to ACS domains
     - Plus rest of http(s) and framework instances
  3. MQ clustering in combination with ACS domains

Conclusion

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- Pathway ACS Domains runs flawlessly
  - Proven during several implementations
- Project runs > 1 years
  - At start scope too big
    - Do not try to solve 100%, but choose the best solution for each situation
    - We end up with 90% covered, but for us project goals are reached
  - Governance
    - Why? Systems already run at very high availability rates
    - It's free?
  - Testing effort

Questions?

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