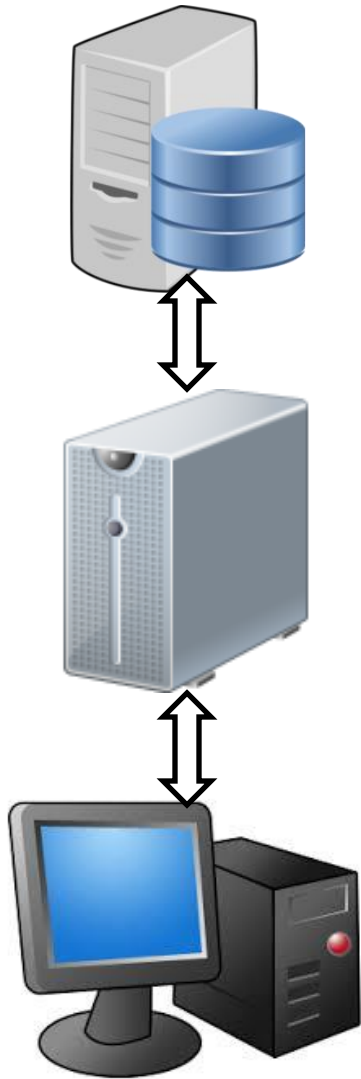


DBS T&M Grid Computing

Pierre-Yves Bouillaud
Executive Director - Investment & Trading Technology
DBS Bank
07-Oct-2013

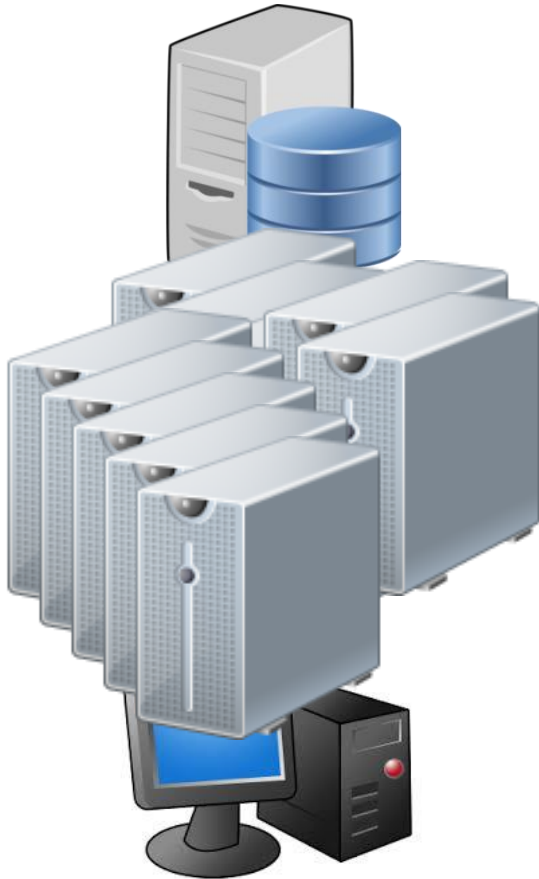
Treasury Application Landscape of a Tier 2 bank in 2000...



- DBS introduces a vendor package application to support Treasury business
 - Front Office (Traders – Sales)
 - Back Office (transaction validation – confirmation – payments)
 - Finance (PL production – Accounting)
 - Risk (Credit – Market)
- 3 tier
- Application layer horizontally scalable

Managing growth... Driven by business AND regulators

Online



Finance



PL analysis



Risk



Did I say scalable?

While Analytics Become More and More Sophisticated

Online

Finance

PL analysis

Risk

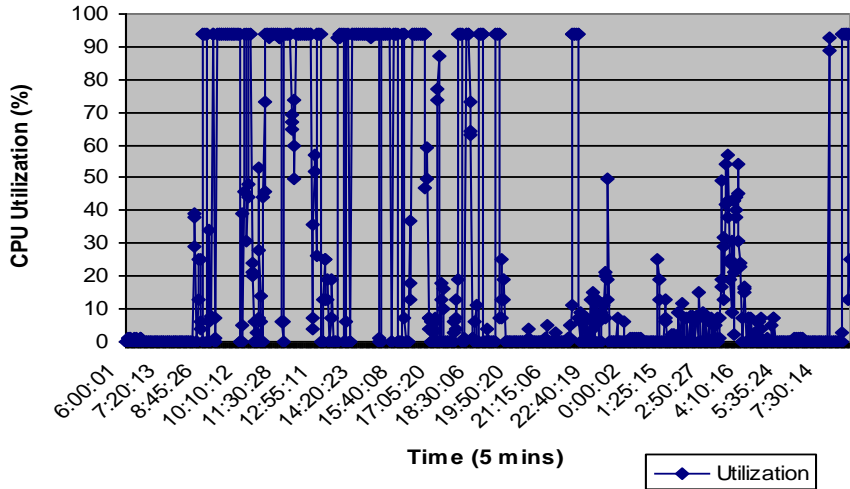


FO models = Risk models

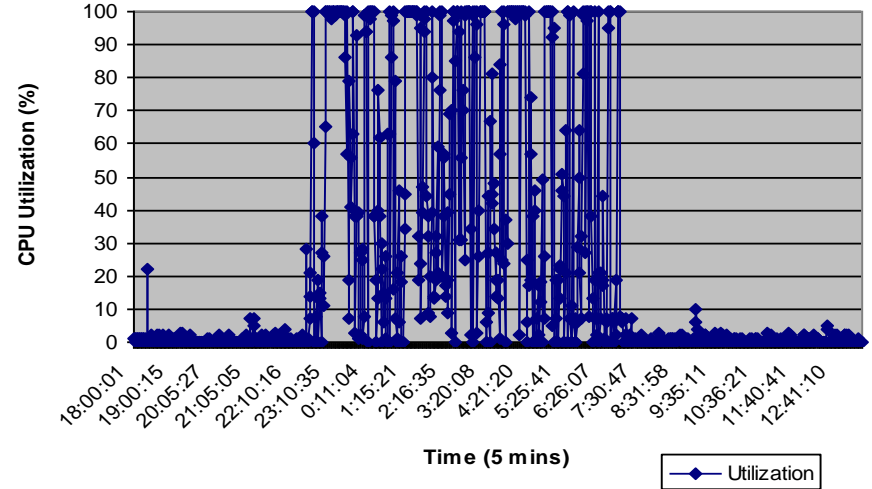
Used for MV, Risk and Pricing

2011... Scalability of compute nodes really is an issue

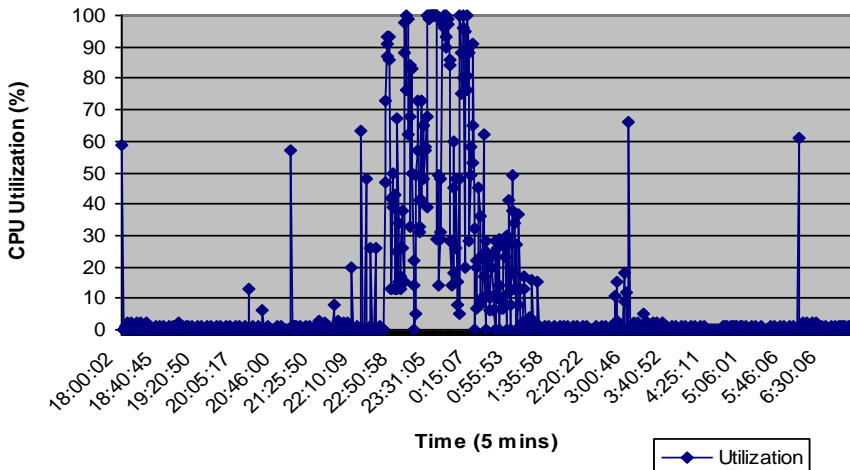
MUREX (Online) MPC Engines



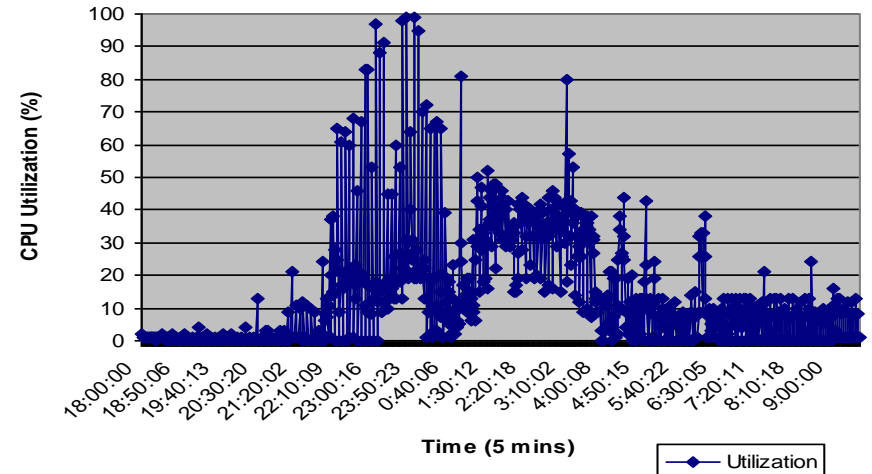
Mx Risk(Batch) MPC Engines



Mx PLVA (Batch) MPC Engines

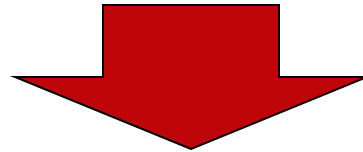


Mx FIN (Batch) MPC Engines

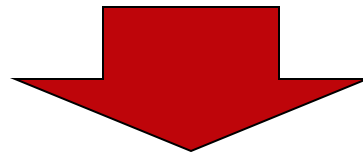


2011... Scalability really is an issue

- Some environments show clear sign of contention
- Infrastructure does not scale easily
- Need to upgrade 4 environments in parallel
- High entry cost for upgrades
- Show stopper for complex models, e.g. local volatility models



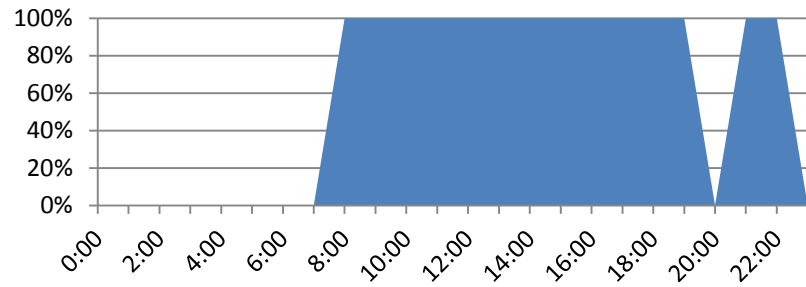
- Unify the compute nodes from all environments
- Leverage the complementary workload between online and batch
- Specialize servers in compute (low memory – fast CPU)
- Use commoditized servers



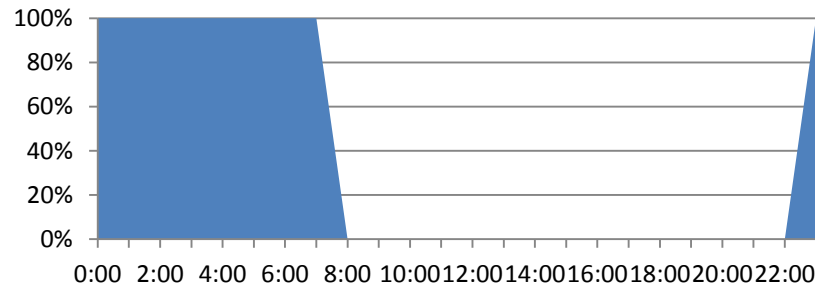
- Introduce Grid computing solution – Platform Symphony

But does not look like a capacity problem

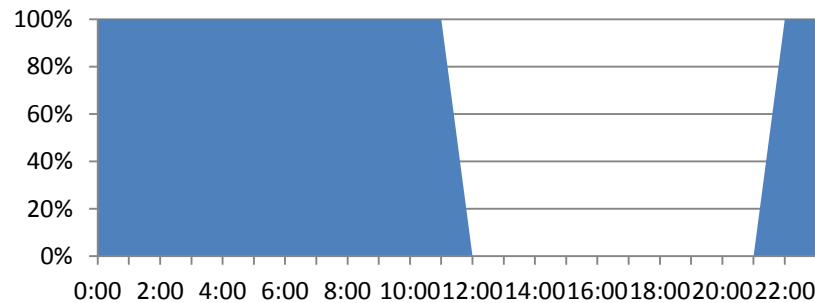
Murex Online Environment



Murex Risk Environment



Murex Finance environment



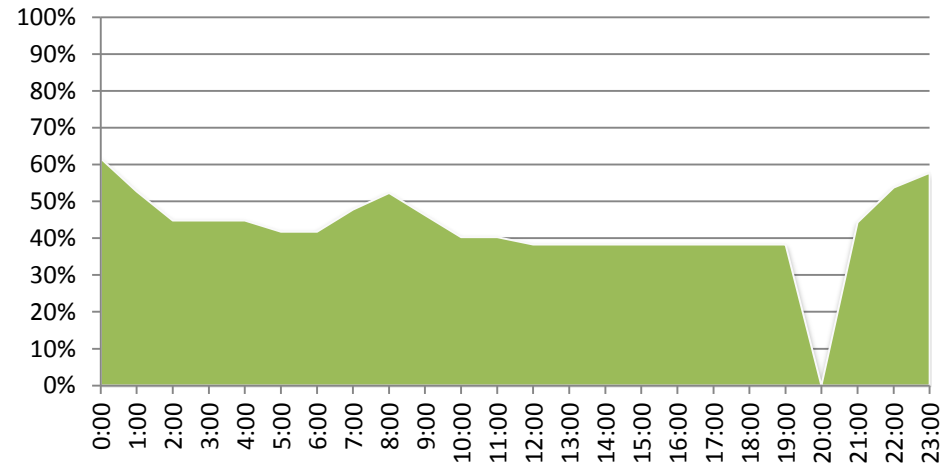
Problems:

- Each environment has its own grid
- Users and batch (Risk) at 100% capacity
- Batch environments used at night only,
- Online environment used intraday only

Approach & Opportunity:

- Form 1 single grid from 4 environments
- Utilize combined resource to “sweat” unused assets
- Implement specialized software

Combined workload & spare capacity



Option 1: Convince this is the right thing to do

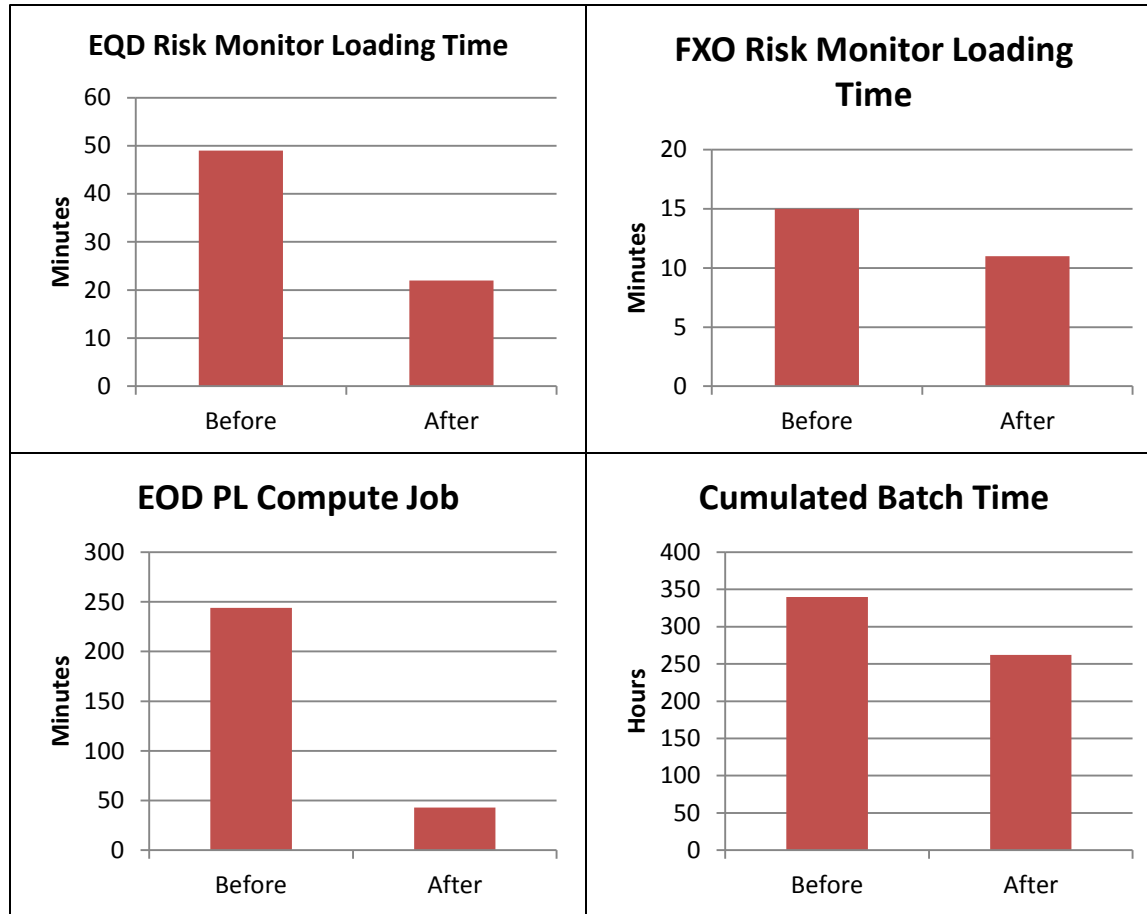
Option 2:

- Show this is the cheapest thing to do
- Address concerns => POC – Seeing is believing

Business case:

- Address immediate scalability issues
- Give priority to traders intra-day
- Yet ensure each group retains its own capacity
- Enabler and cost saving for new model to be implemented (FXO local volatility)

- Day 1



- And now:

- Grid increased x6
- Fully adopted... looking at next gen of enhancements...