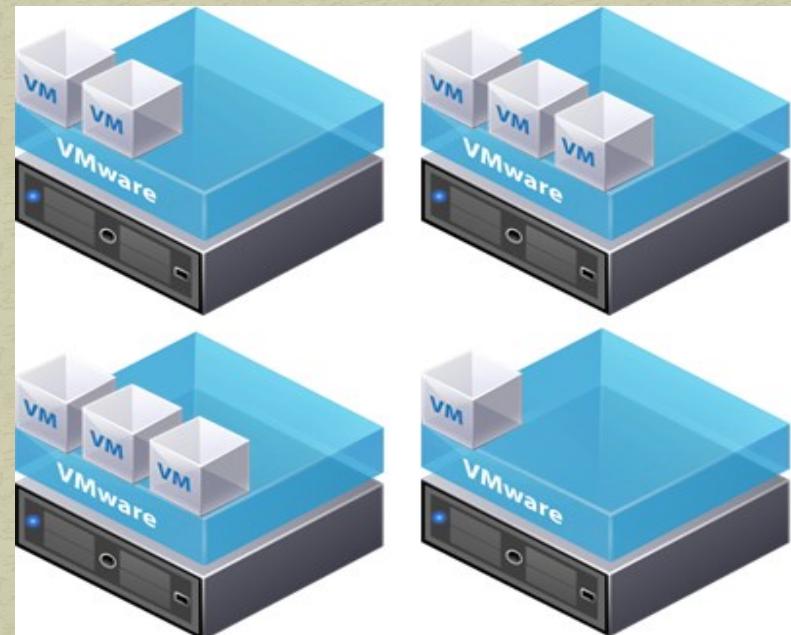
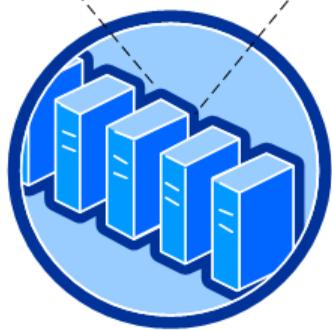
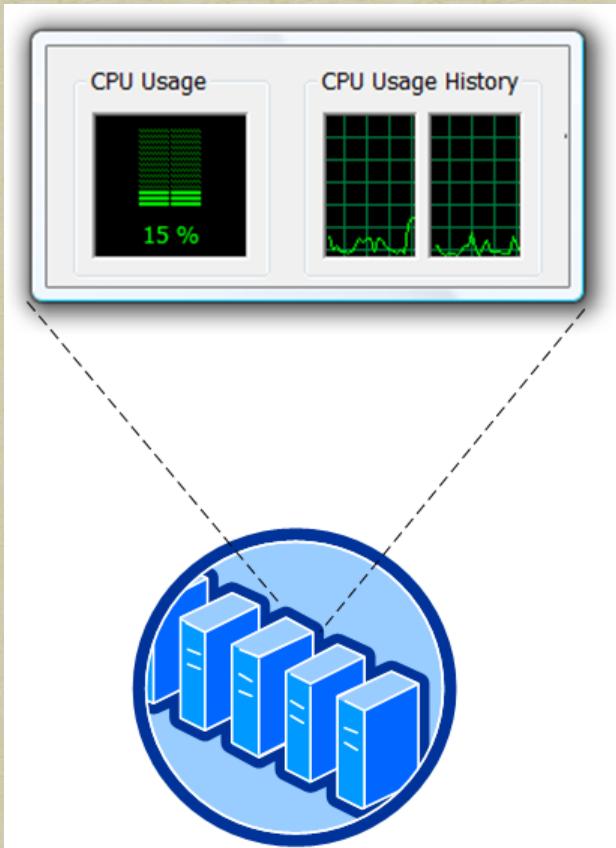


Energy Efficient VM Placement Supported by Data Analytic Service

Dapeng Dong and John Herbert

University College Cork
Mobile and Internet Systems Laboratory
The Telecommunications Graduate Initiative

Background



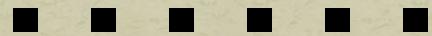
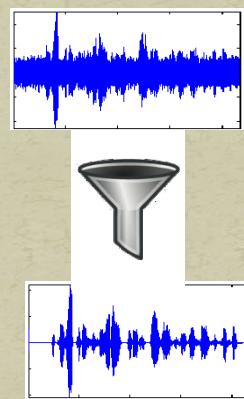
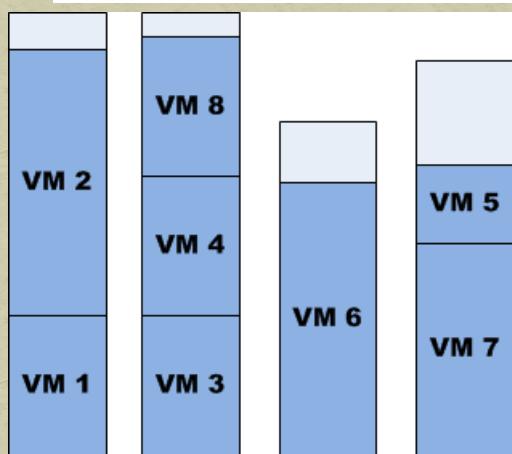
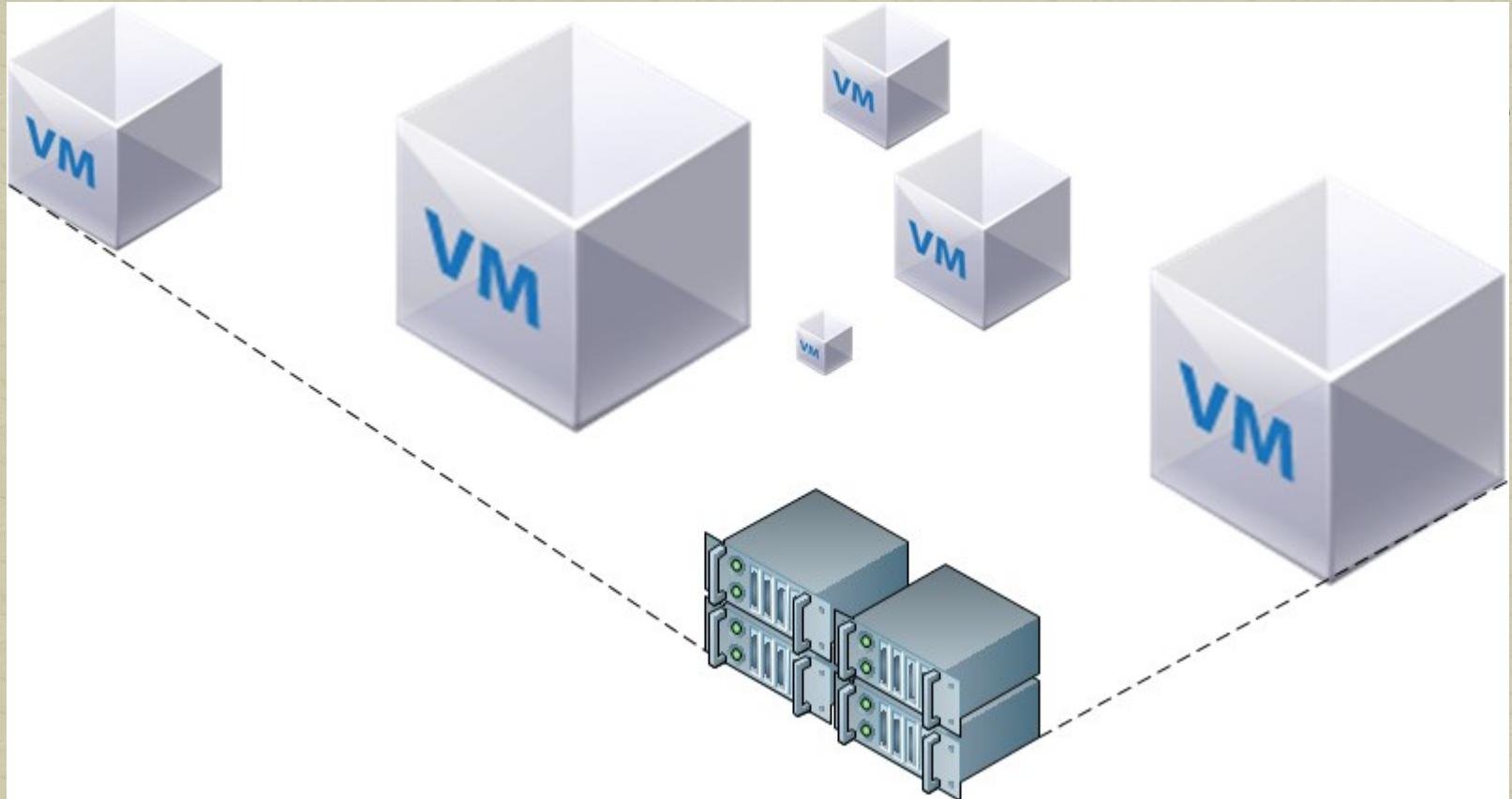
SLA = \$

Objectives



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Analysis



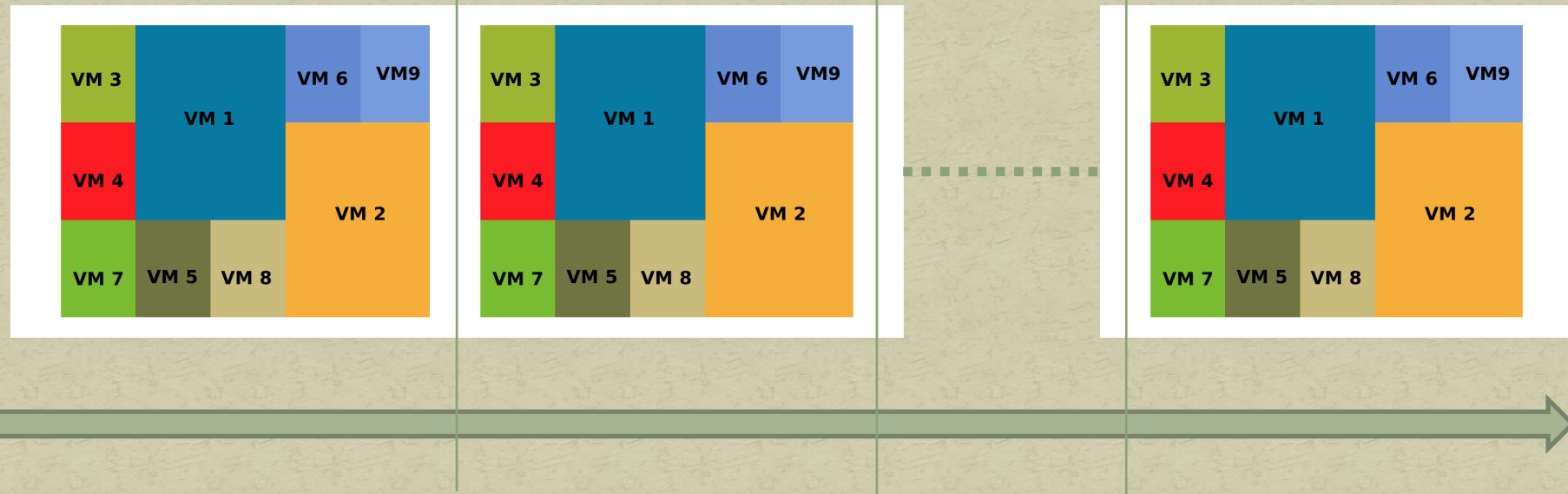
Time A



Time B



Time N



Example – the dynamic cloud



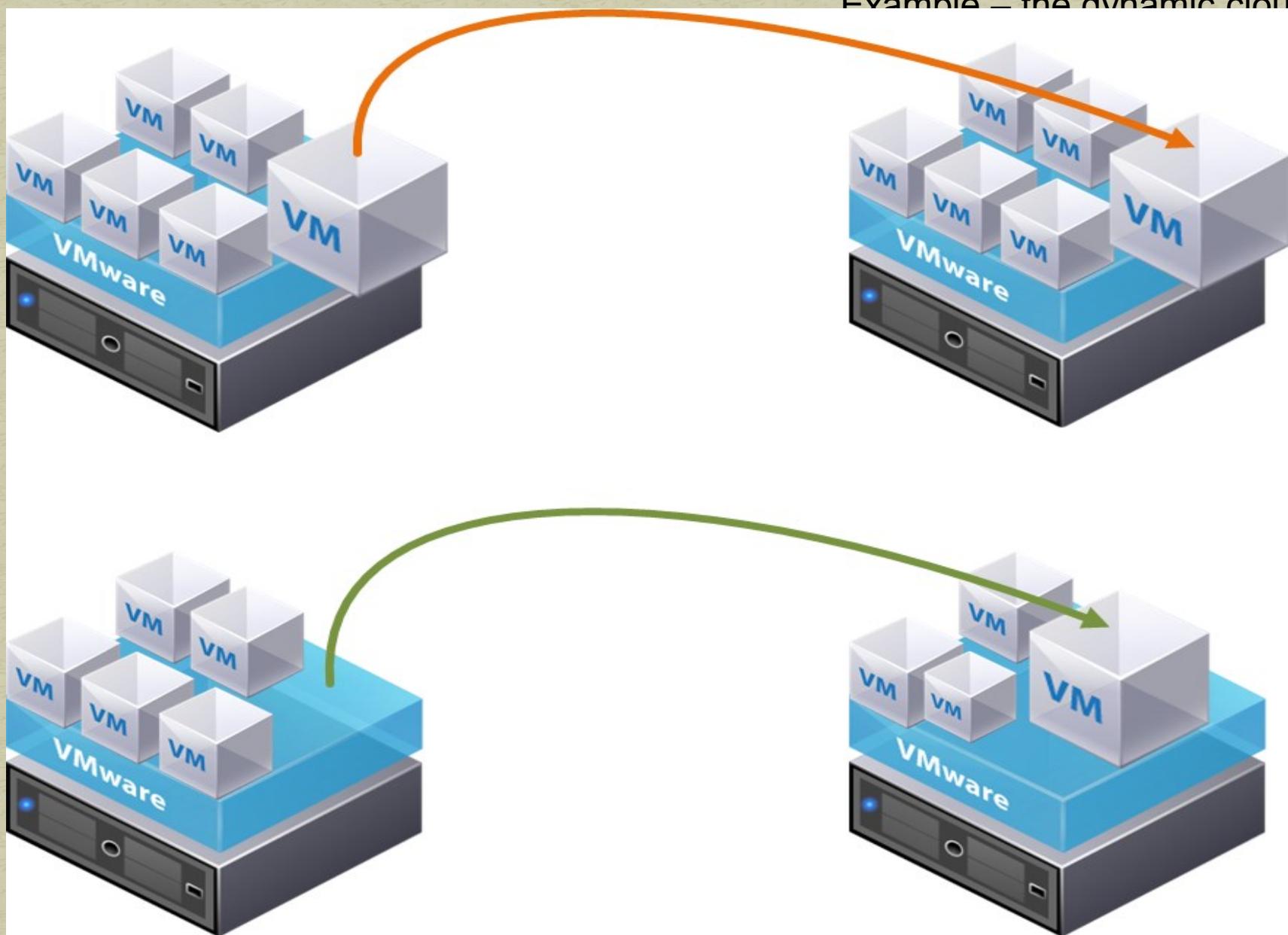
Time A

Time B

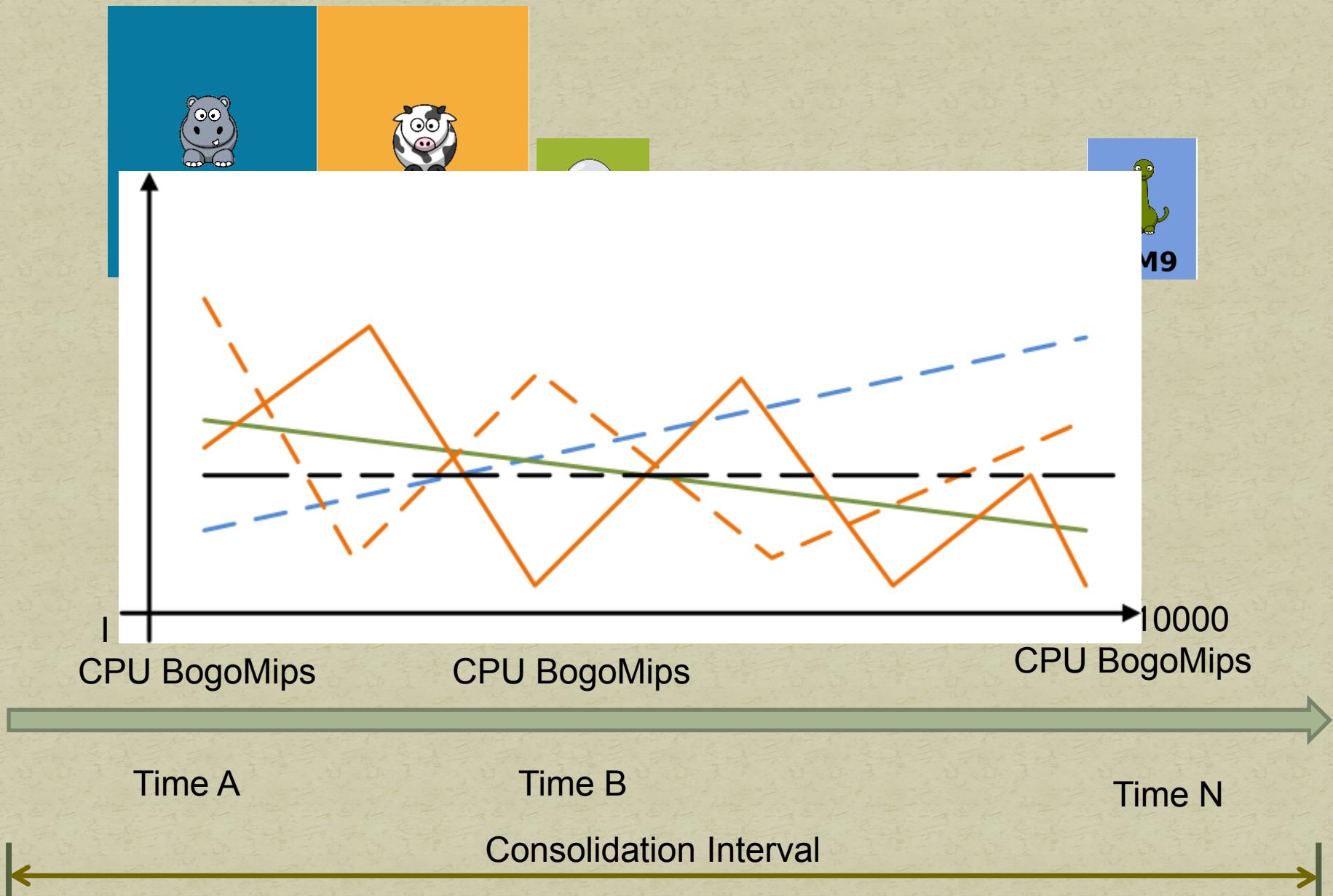
Consolidation Interval

Consolidation schedule

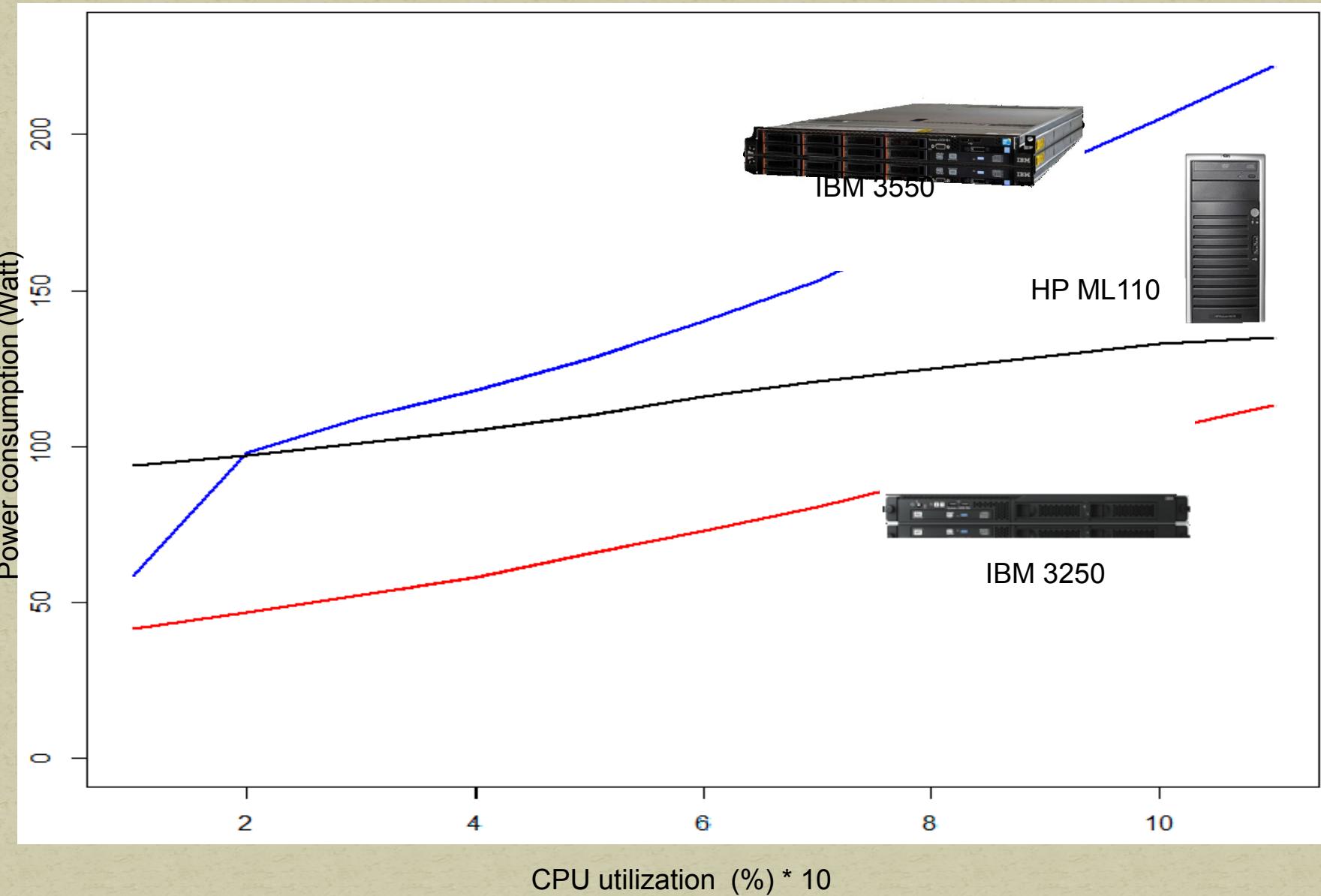
Example – the dynamic cloud



Guarantee QoS



Cloud is heterogeneous



Example – choose right server(s)



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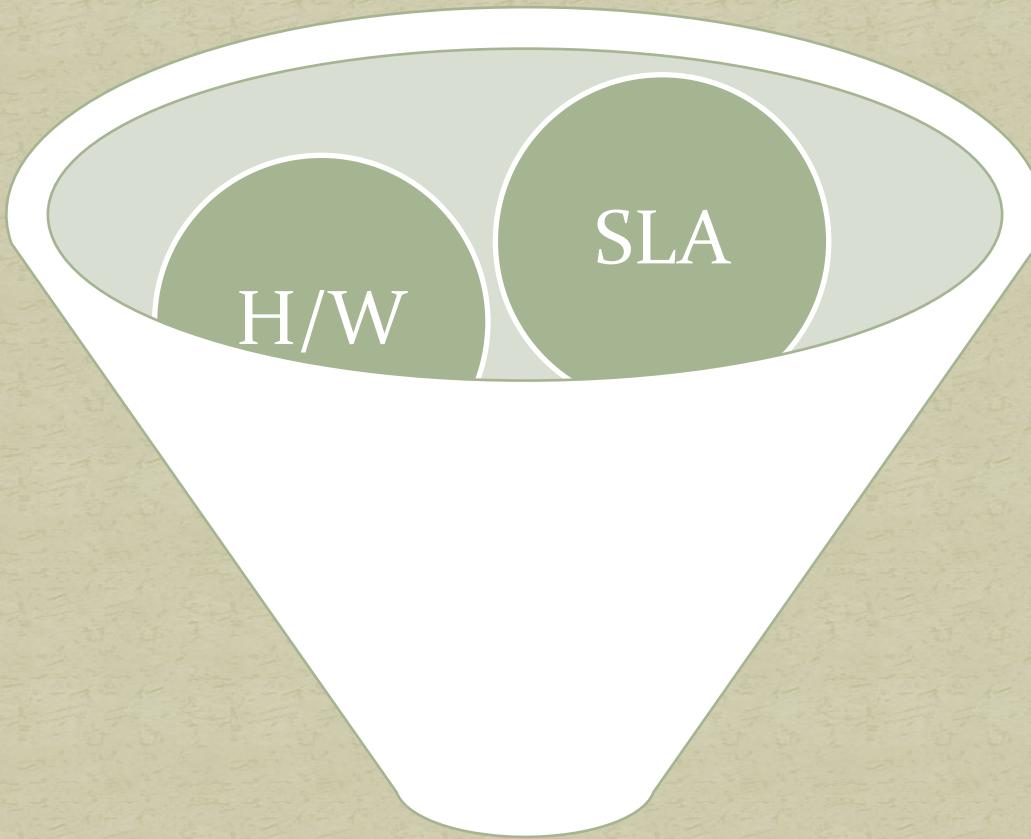
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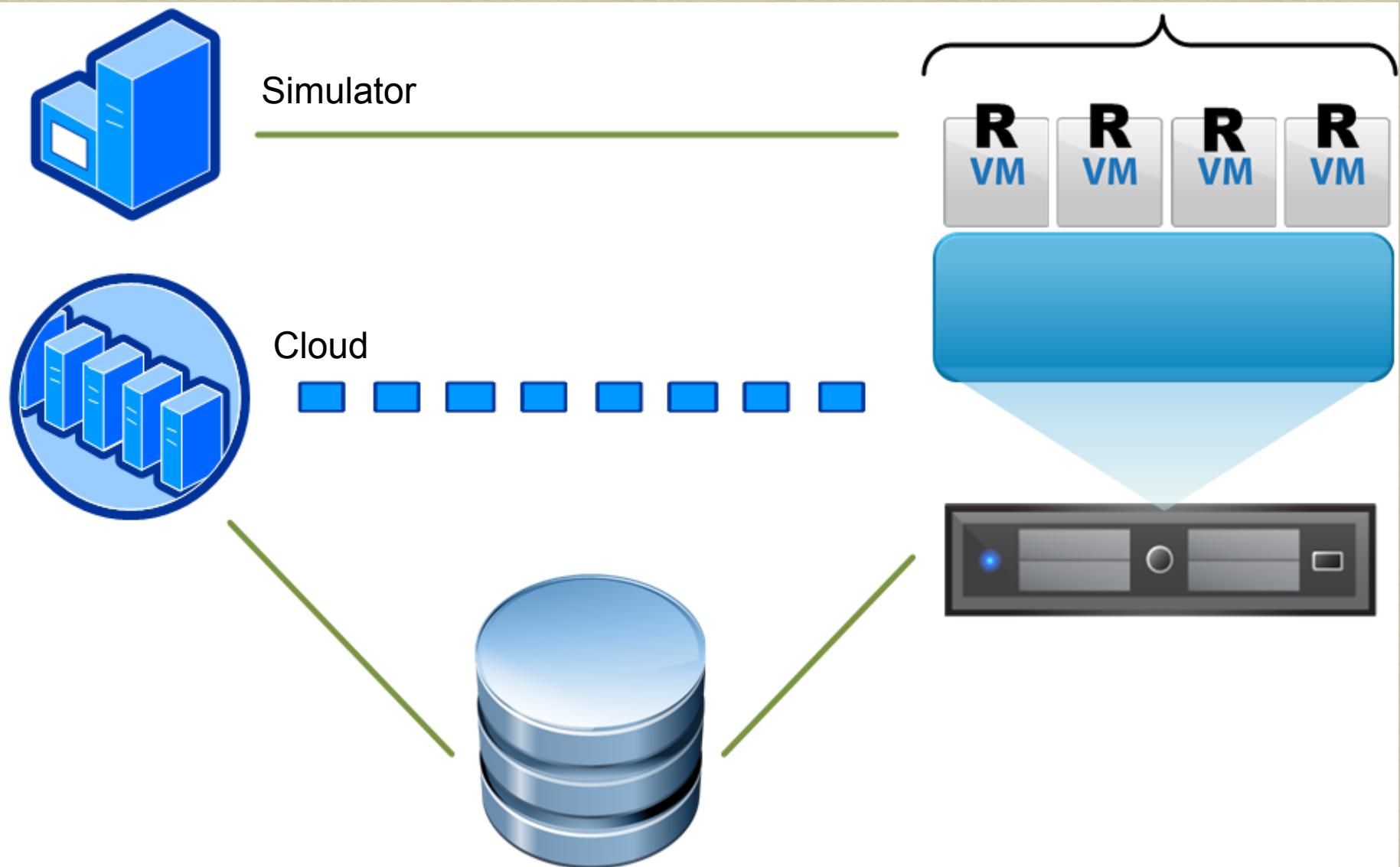


VM placement arrangement

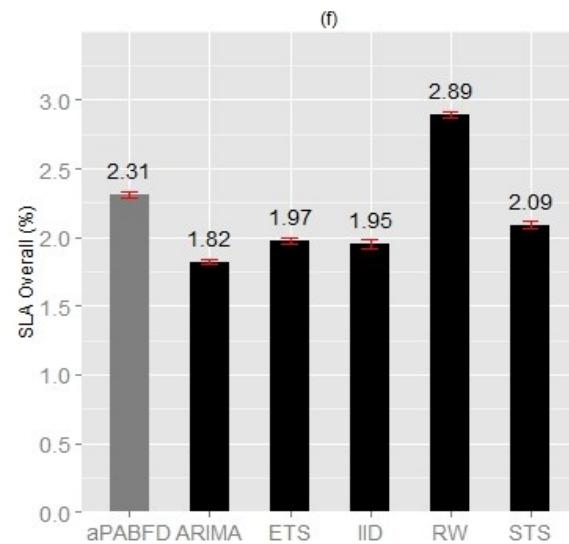
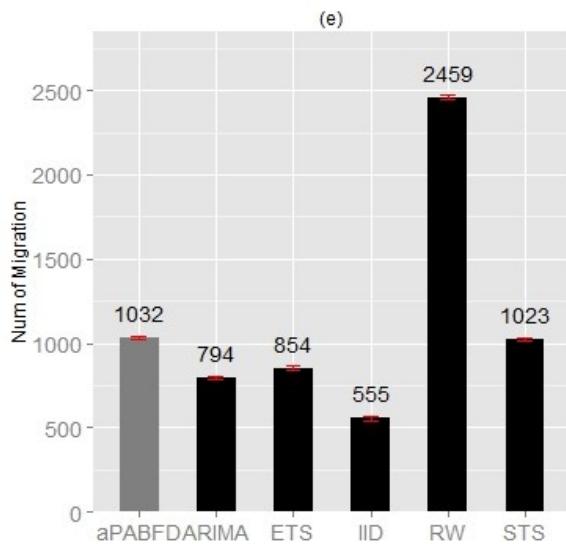
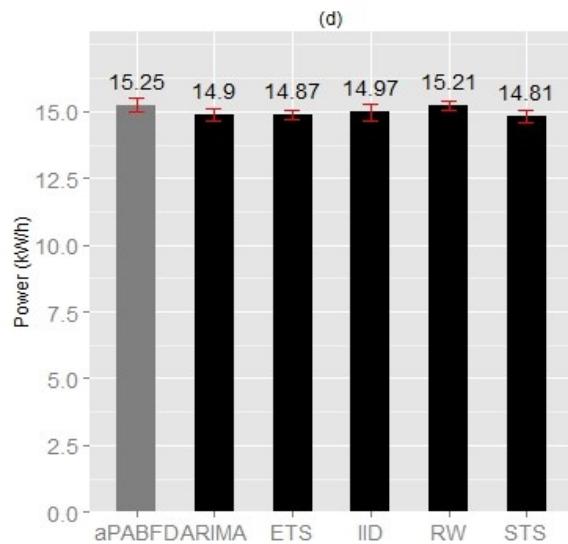
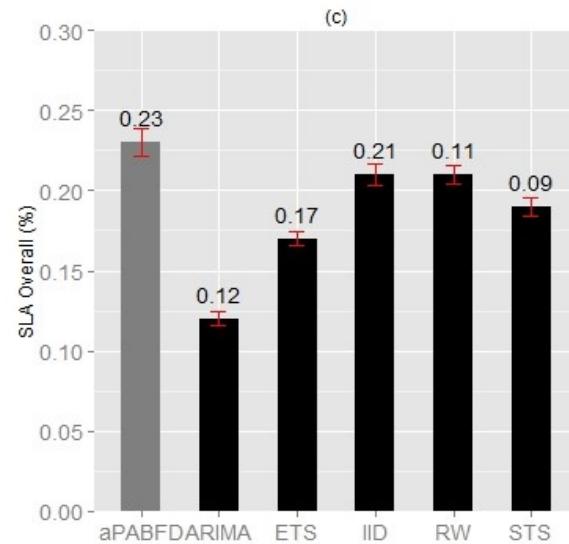
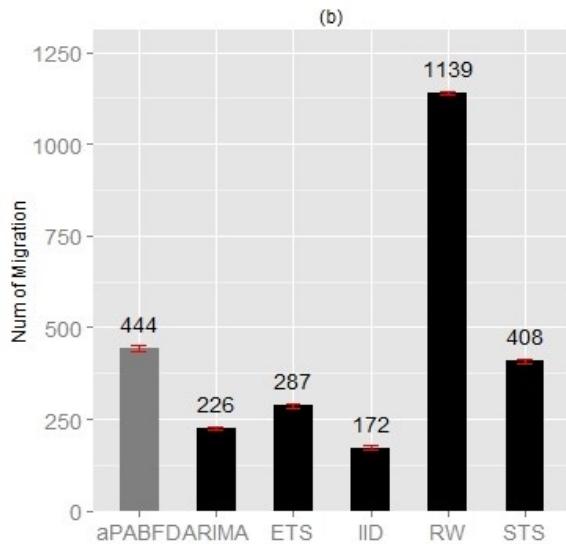
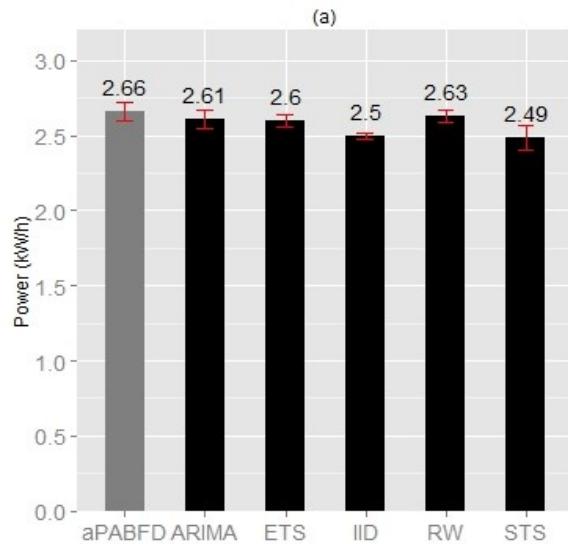
Let the data analytic service do the job



The hard worker



Evaluation - effectiveness



Real-world workloads

Random workloads

Evaluation - performance

Algorithm

● ARIMA

▲ ETS

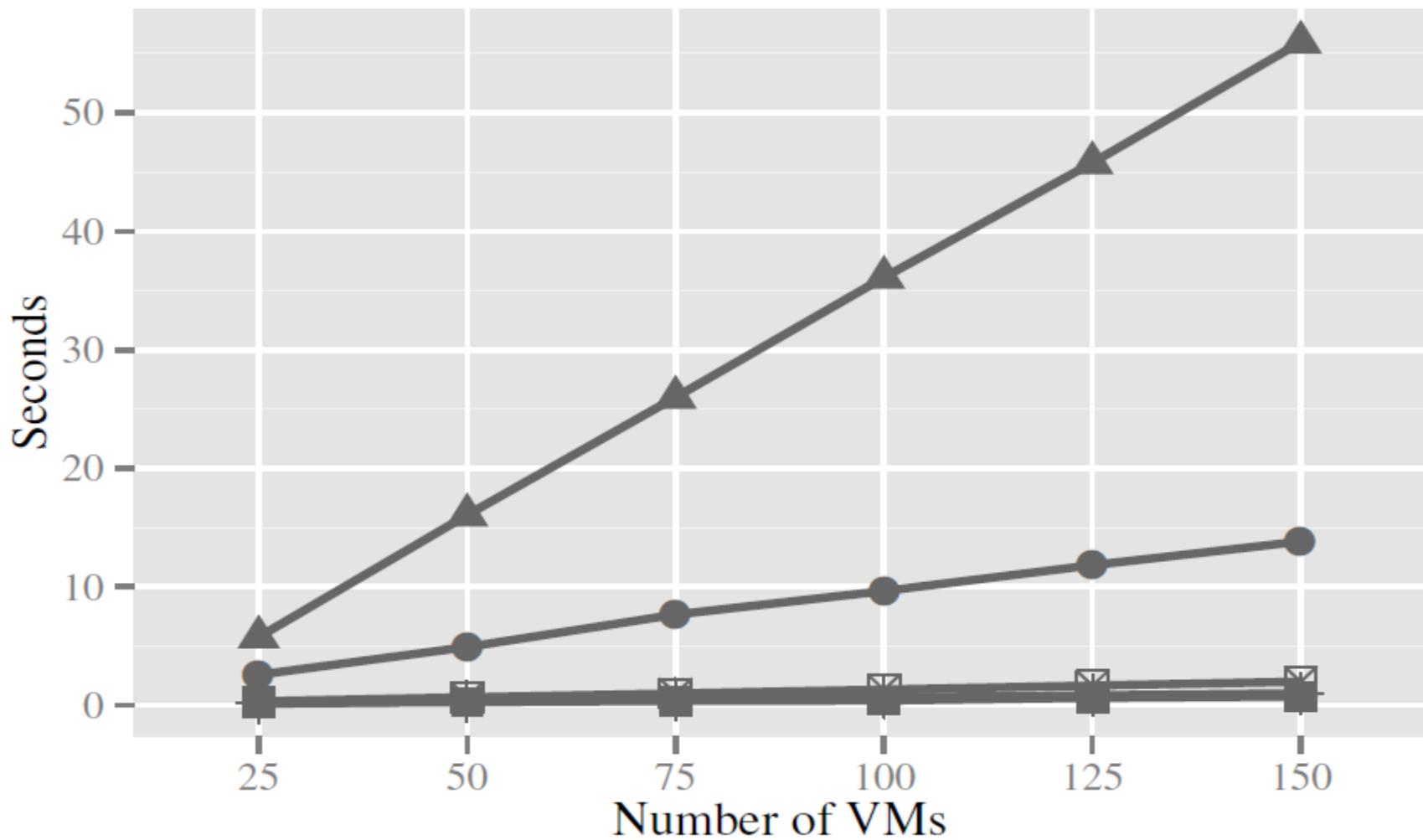
■ IID

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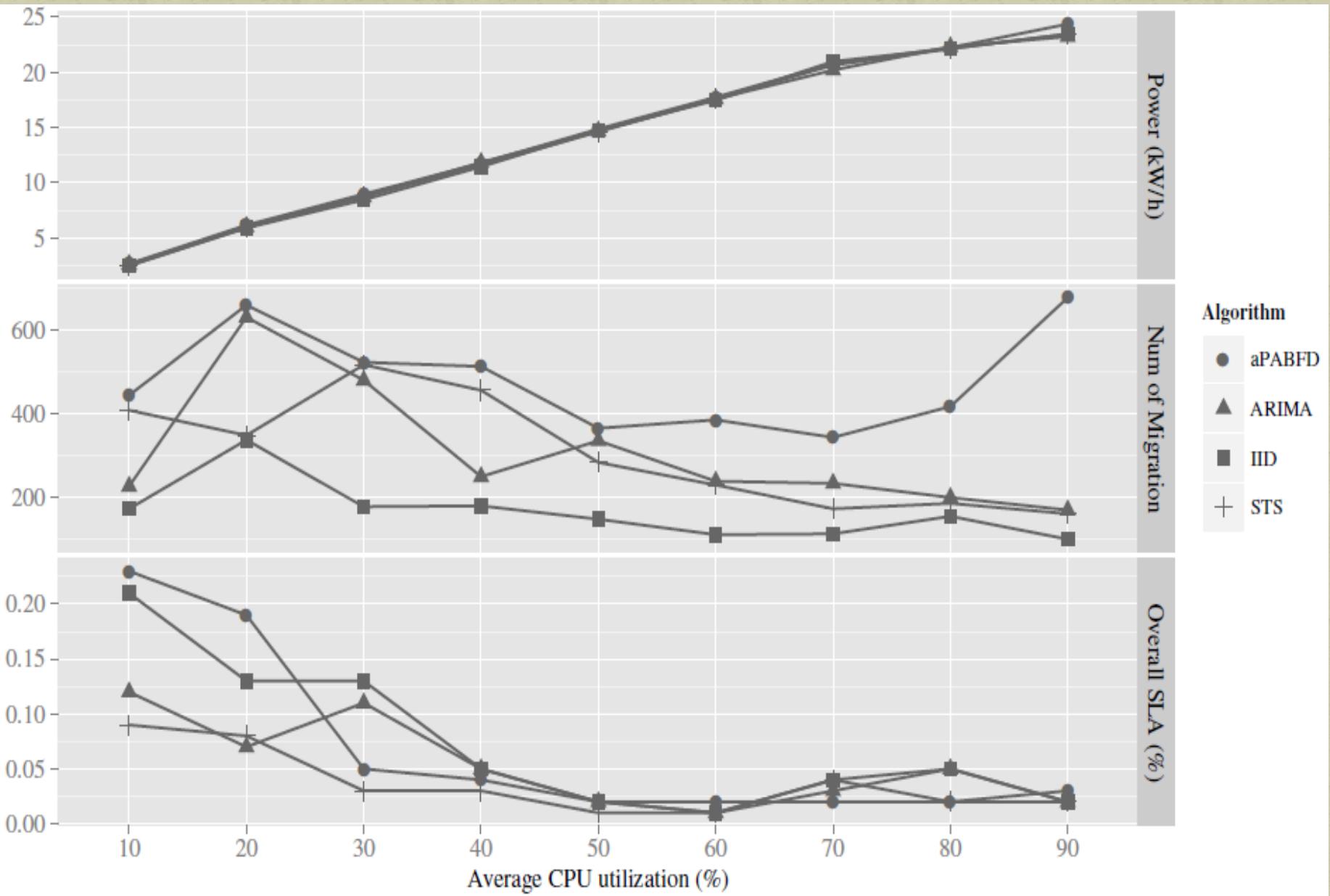
RW

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STS

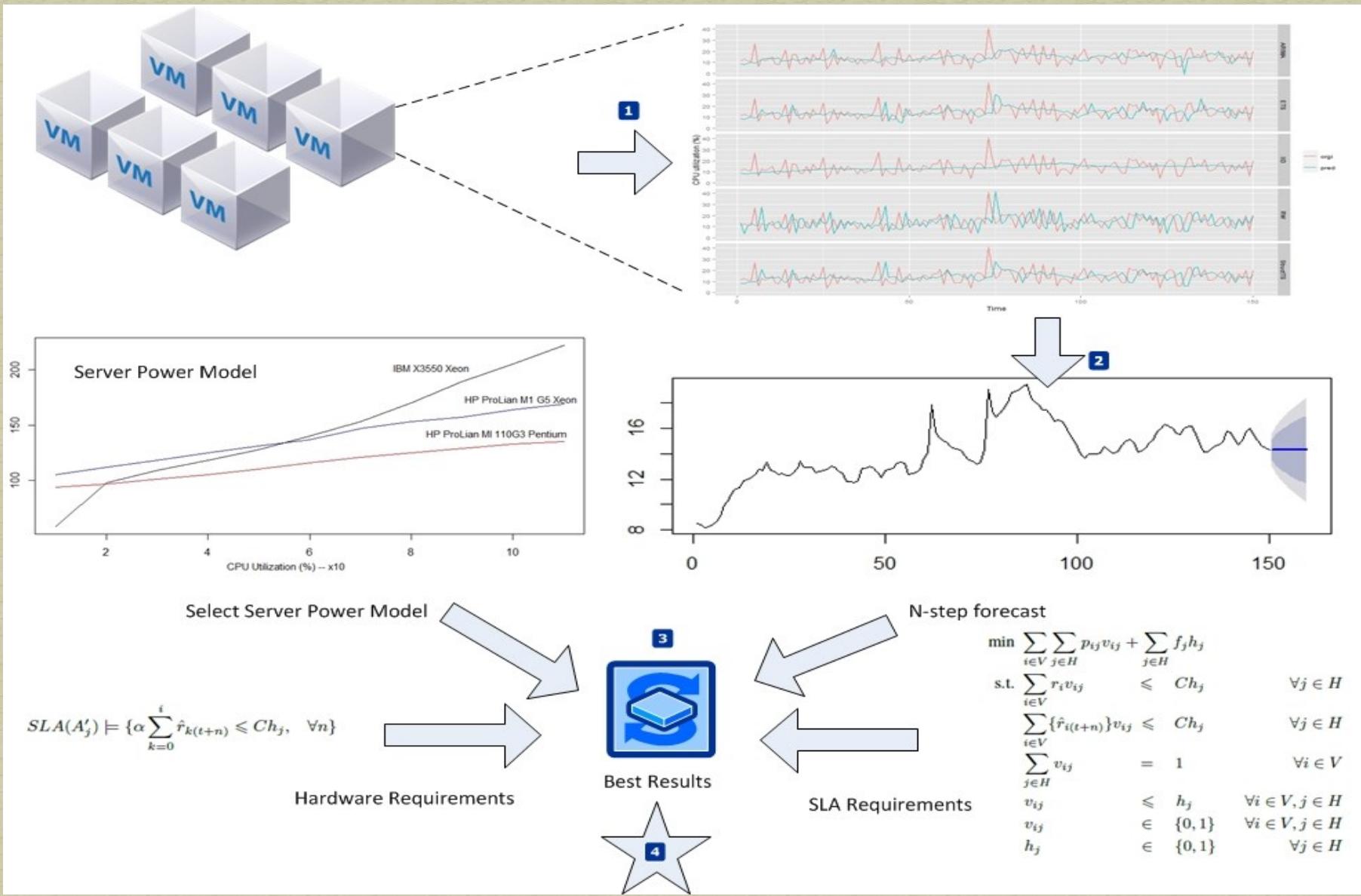


Evaluation - robustness

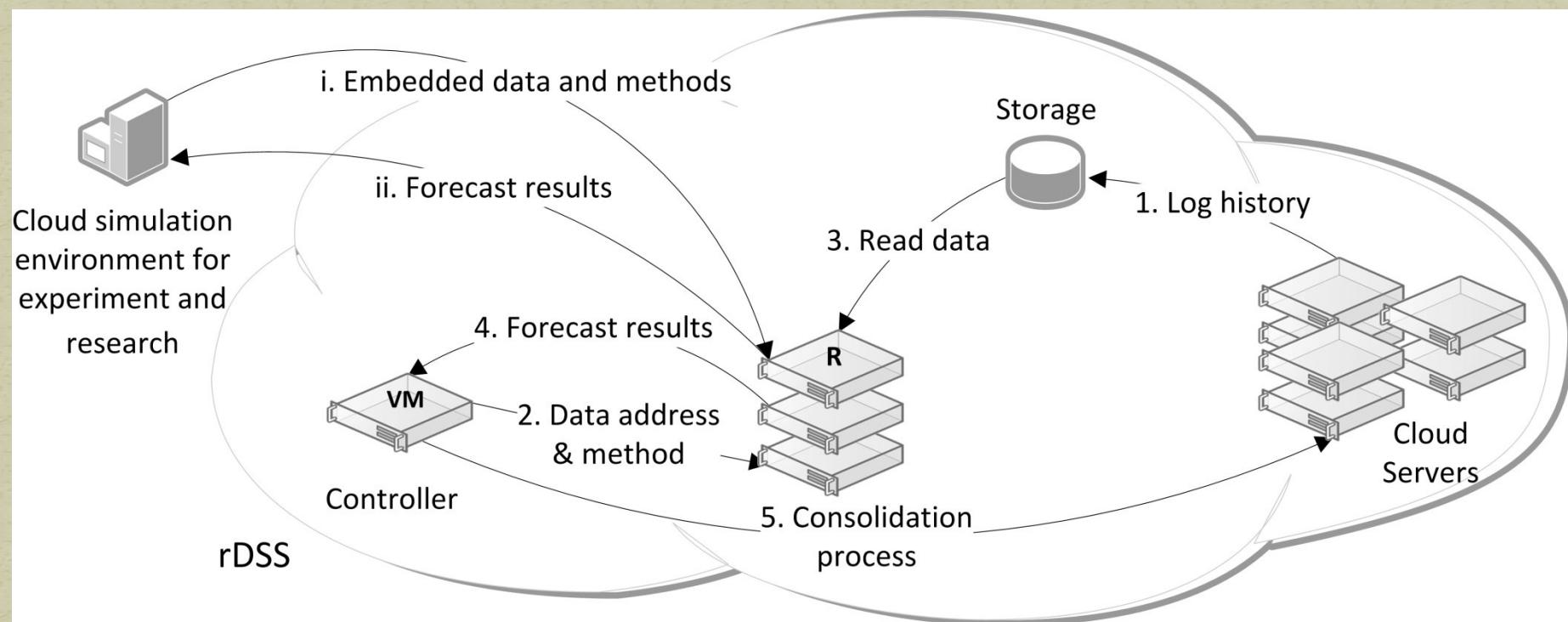


Thank you !

All in one

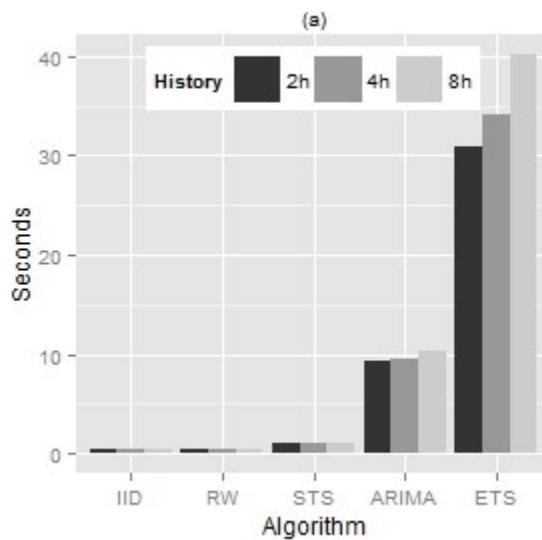


System architecture

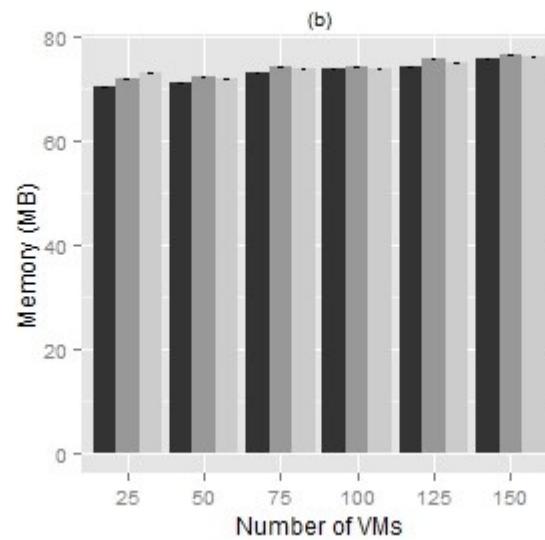


Evaluation - rDSS

Performance



Memory Requirement



Bandwidth Requirement

