



HPC in the cloud or on-premise?

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Teratec, June 2018



Agenda



On-premise HPC



HPC in the cloud

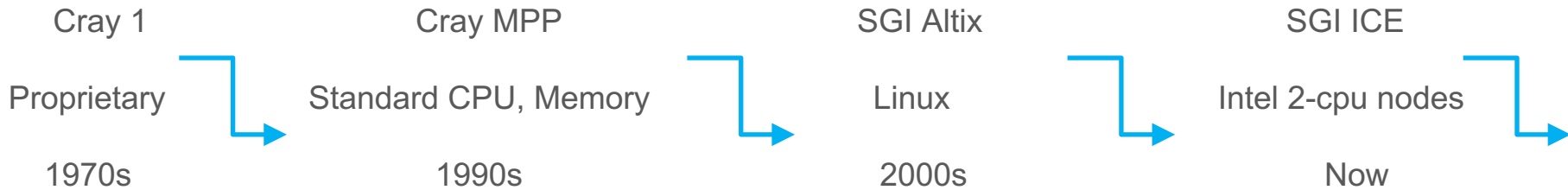
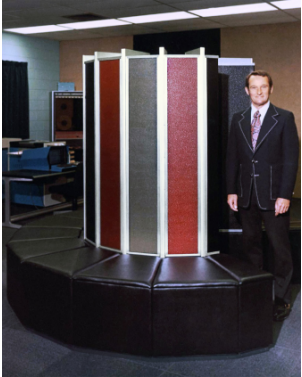


**Hybrid HPC:
Cloud & On-premise**



High Performance Computing on-premise

A History of Disruptions



HPC On-premise

Benefits

- A well understood model
- On-premise systems provide architectures optimized for HPC



HPC On-premise

Challenges

- Diversity of emerging architectures
- Matching the workload with size of the system
- Time lag to acquire and provision a new system
- Performance decline over the years
- Big capital expenditure + cost of managing the system



HPC in the cloud

HPC in the cloud

- Instant access to unlimited resources
- Choice of architectures
- Application runs on best suited architecture
- Jobs run with no wait
- Engineers not constrained by the size of a system

Implications

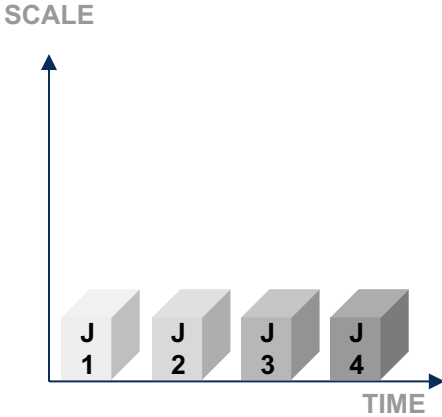
- Faster innovation, shorter cycles, improved time to market
- Immediate provision, variable size, no capital investment
- System utilization, job queues, downtimes, are a thing of the past



Scalability: faster results, shorter turnaround time

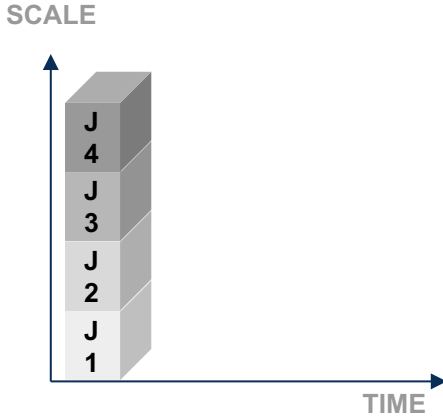
On-premise HPC

Jobs queued

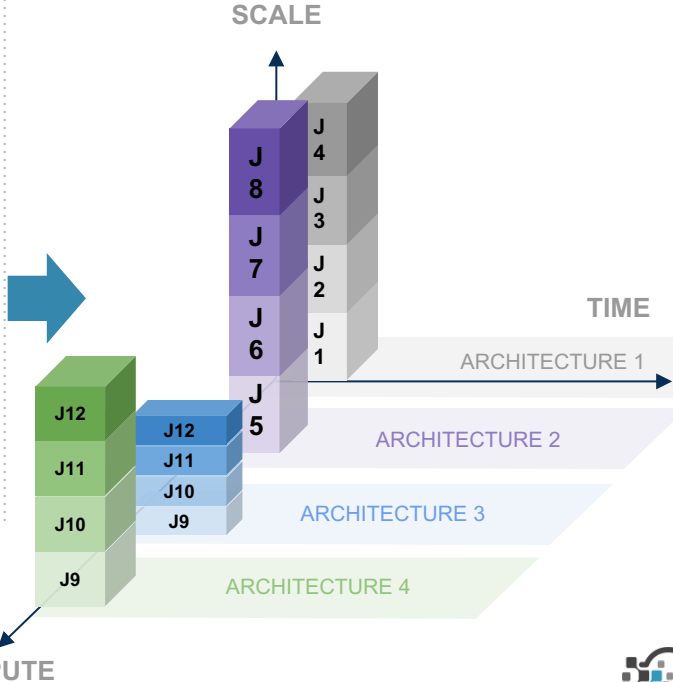


HPC in the Cloud

Concurrent submission



Optimized compute resources



HPC in the cloud

Using cloud providers directly

Benefits

- Choice of architectures
- Access to virtually unlimited resources
- Systems available today
- Engineers not constrained by the size of a system
- Run on the latest architectures
- Pay per use of hardware



Challenges

- Provision systems in the cloud
- Build software stack
- Maintain and tune applications
- Select the applications to move to the cloud
- Select the right architecture
- Deal with multiple cloud providers
- Manage software licenses on premises and in the cloud
- Cost control and consumption

HPC using Cloud Providers



The Rescale HPC Platform



FULLY INTEGRATED
STACK OF
ENTERPRISE
DEPLOYMENT TOOLS



Rescale ScaleX Platform

- Enterprise big compute
- Innovation acceleration
- User-first platform
- Security and admin controls



Platform implementation strategies



Cloud Native

- Elastic scaling on demand
- Turnkey
- Zero IT footprint



On-premise HPC

- Submit jobs on-premise
- Administration portal
- Analysis and reporting



Hybrid: Cloud & On-premise

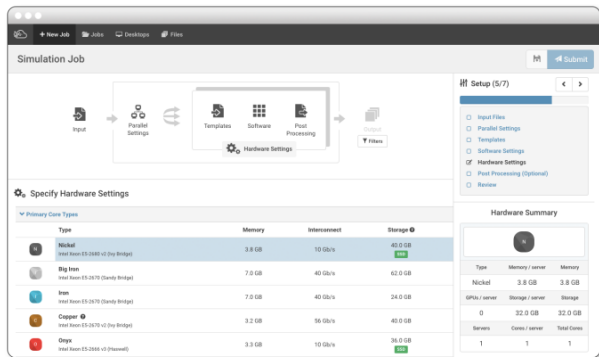
- Extend to cloud on demand
- Seamless transitioning between architectures
- Disaster recovery

Advantages of both



Hybrid HPC with Rescale

Step 1 - Add access to on-premise HPC systems from the Rescale portal



Rescale portal
GUI and API

Status

Job
Scheduler



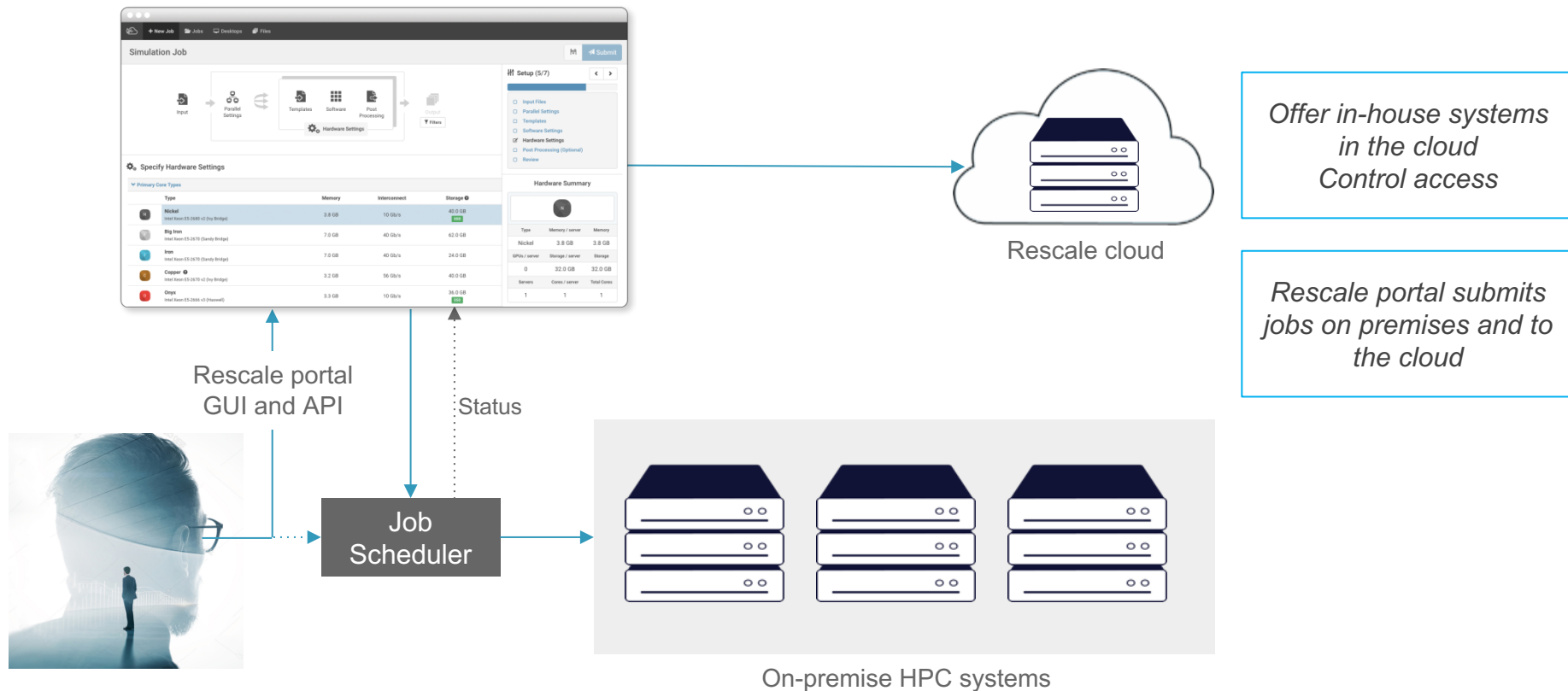
On-premise HPC systems

Multiple on-premise
HPC systems are
pooled behind the
Rescale interface



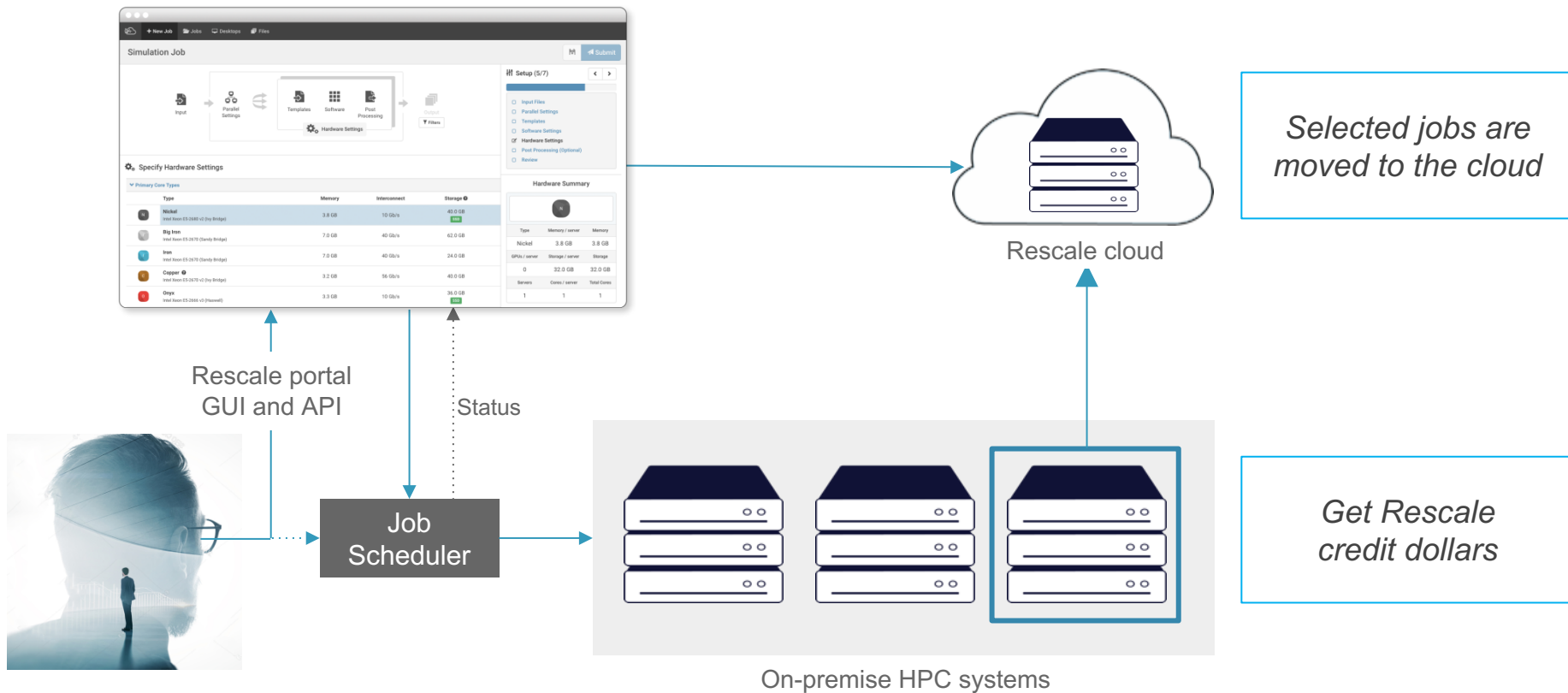
Hybrid HPC with Rescale

Step 2 - Add cloud access from the Rescale portal

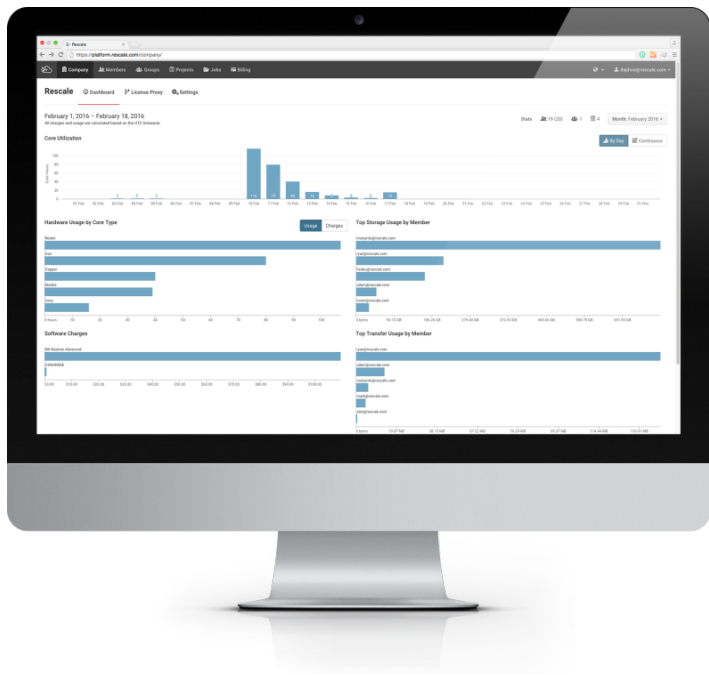


Hybrid HPC with Rescale

Step 3 - Offer on-premise systems in the external cloud



One platform to access and administer all systems



Key Enterprise Features

Role-based Access

- Manage users
- Manage roles
- Manage groups
- Manage projects

Platform

- HW access, regions, and pricing
- SW access, licenses, and pricing
- Platform features access
- Data retention and sharing settings

Security

- Restricted access by IP address range
- Password complexity rules
- Multi-factor authentication (MFA)
- User audit logs & notification rules

Cost Management

- Budget by level
- Reports by application type
- Payment methods and history
- License usage optimizer

Connect

- On-premise compute and storage
- PDM/SLM integration
- VPN
- Single sign-on (SSO)



Transformative Benefits

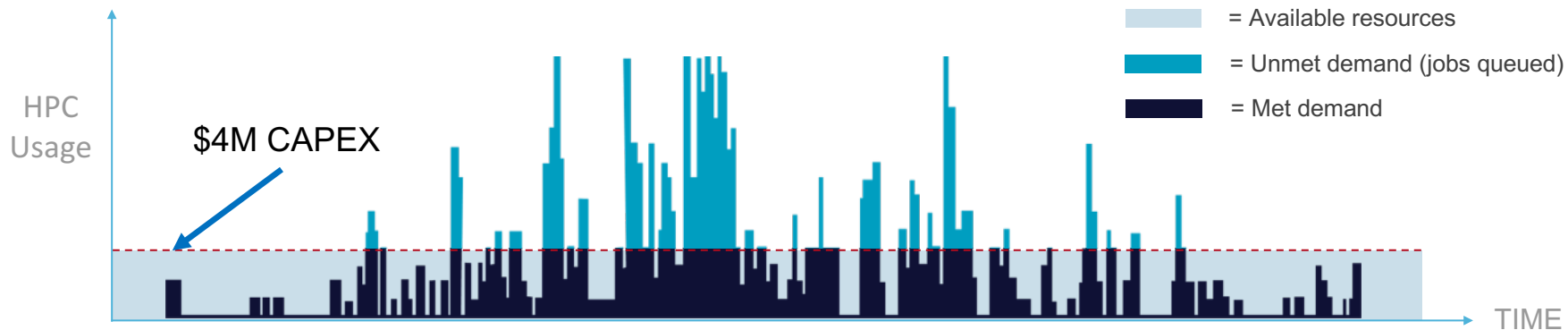
A new approach to HPC

- Hybrid cloud with on-premise support
- Multi-cloud environment
- Access the latest architectures with no wait
- 250+ applications ported and tuned
- Recommends the best architecture for each job
- Configurable SaaS workflow reduces the need to develop and maintain custom scripts for each system
- Fast learning curve for new HPC users
- Pay per use for hardware and software
- One platform to access and administer all systems

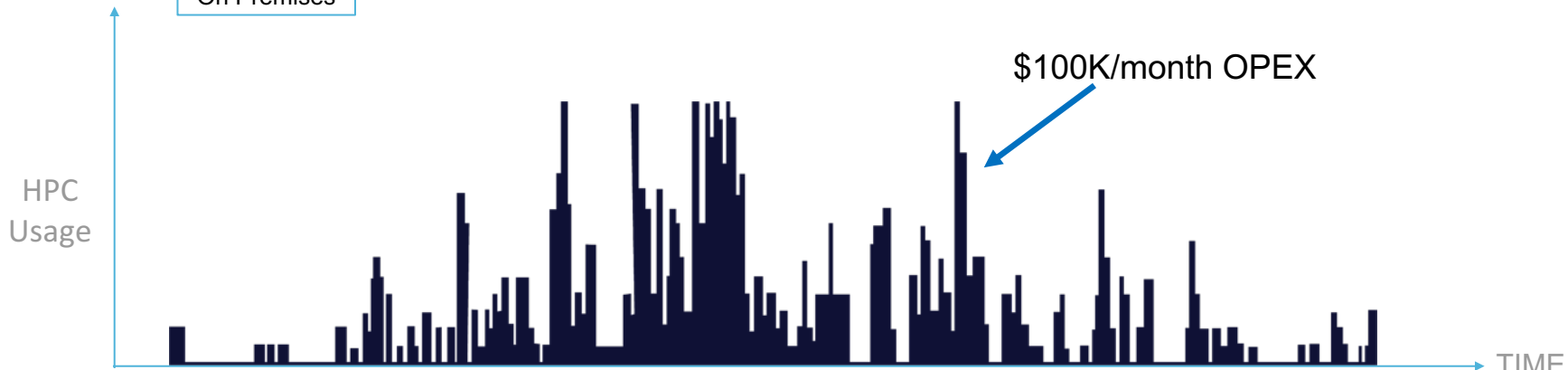


Cost of on-premise vs cloud

Tier 1 Automotive Supplier Example



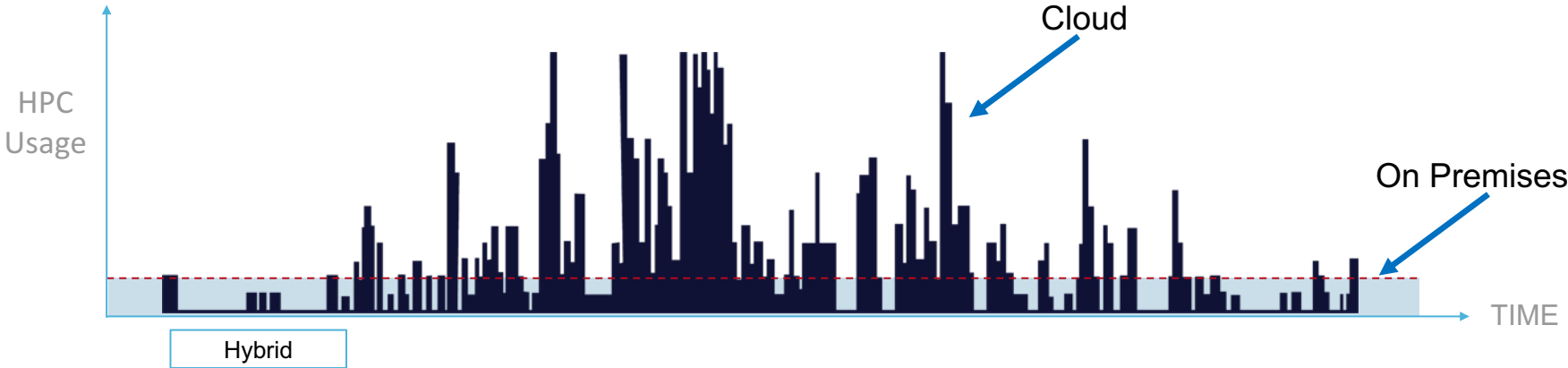
On Premises



Cloud



Optimizing cost with Hybrid



Place workloads to achieve best possible result



Summary



On-premise HPC

- Constant Workloads
- Single Architecture
- Queue jobs



HPC in the cloud

- Variable Workloads
- Multiple Architectures
- Run with no wait



Hybrid HPC: Cloud & On-premise

- Extend on-premise HPC to cloud
- Match workloads to the best architecture

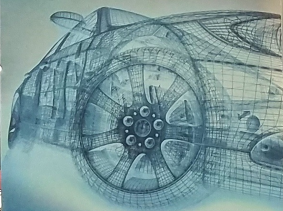
Advantages of both





rescale

is HPC in the cloud



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HPC 2017
Readers' Choice Awards
Best Use of HPC
in the Cloud

Boon Singapore uses Rescale
to scale cloud HPC and
MCA simulation to design
Singapore's new airport



rescale

