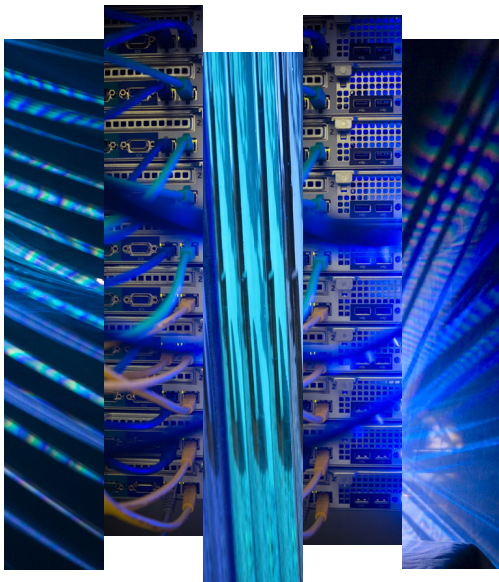# HPC CLOUD JOURNEY

Across all industrial sectors, the alliance between data analytics and numerical simulation has become an essential tool driving industrial, scientific and societal innovation despite the complexity of implementing and using HPC infrastructure.

In this context, facilitating the transition toward hybrid environments, integrating flexible and on-demand resources with existing HPC infrastructures is what UCit defines as "The HPC Cloud Journey".

To help clients along their journey UCit have developed the following methodologies and assets.

Consulting	Prototyping	Pre-production / Staging	RUN

Analyze-IT	WorkCloud	CCME	Integration Licenses Data Security	Budget	HPCaaS

Workload Selection / Budget Estimate	Risk Evaluation / Benchmark Definition	Configurator Input / Risk Assessment		Budget Alerts / Flexibility Model

"The HPC Cloud Journey" with UCit

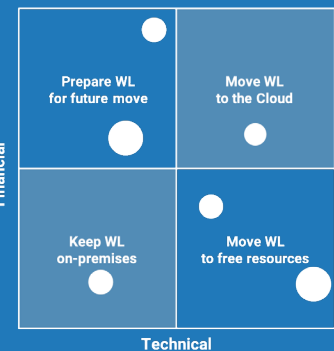## UCIT ASSETS

Reference Architecture
Because it's better to understand the language as you start the journey

WorkCloud
To answer the following questions
• Which of my Workloads could move to the Cloud?
• How many resources should I plan for?
• What will be the associated costs?

WorkCloud Quadrant

CCME
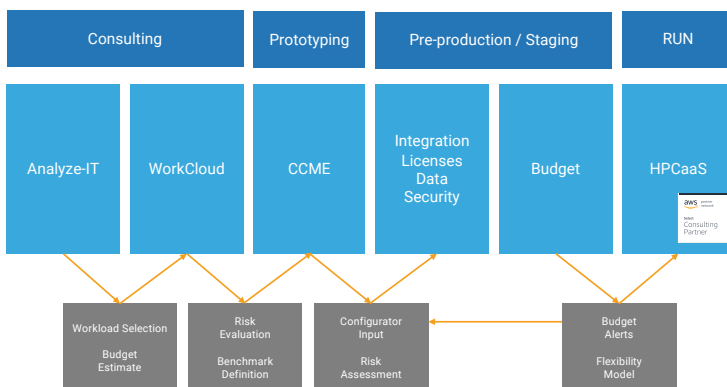For fast prototyping, benchmarking, CCME deploys a fully functional HPC cluster… In production it becomes the essential tool to leverage cloud flexibility in demanding high performance environments
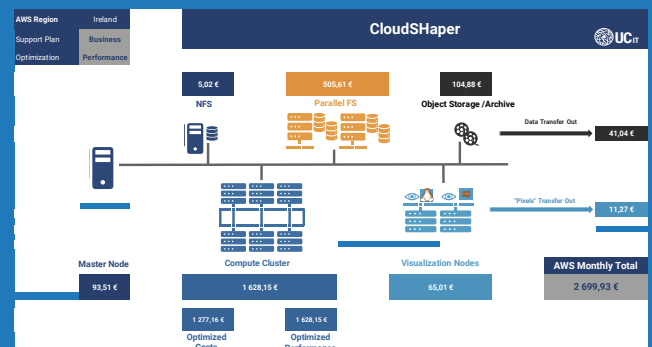
CloudSHaper
To understand the budget and set the necessary alerts and actions to always be in control

CloudSHaper enables clients to budget the costs of their HPC workloads on the Cloud

WorkCloud Methodology

WorkCloud consists of a multidimensional assessment (geographical, users, time, resources/applications, business…) of an HPC workload:

Technical feasibility: identification of technical requirements of the workload, and assessment of technical feasibility in the cloud

Load: identification of required compute surface

Variability: identification of workload durations, request frequency, involved users/departments…

Financial: determination of various deployment scenarios with associated costs. For each of the above axes, we identify opportunities and showstoppers.

Compute: hardware requirements (cores, ram, network…)

Storage: type, size and performances – on-prem parallel file system performance baseline

Data transfers: network requirements between on-prem and cloud for file transfers, remote visualization streams…

Software licenses: compatibility with Cloud usage – prerequisites for access to licenses

Security & confidentiality: internal or legal constraints on input or produced data – user locality…

The whole WorlCloud methodology is backed by data and models computed by Analyze-IT and our HPC Cloud Configurator.

CCME transformation of an HPC cluster in a an HPCaaS solution on AWS.

CCME Software Components	
OS: Master, Compute & Linux Visualisation Nodes	CentOS 7
OS : Windows Visualization Nodes	Windows Server 2012R2 or 2016
Job Schedulers	SLURM 16.05
	Torque 6.0.2 + Maui 3 .3.1
Parallel File Systems	BeeGFS 7.0
	Lustre (FSx for Lustre coming in 2H2019)
Other File Systems	NFS, EFS or S3FS
Object Storage	From S3 to S3 Glacier Deep Archive
Remote Visualization	NICE DCV 2017.2
HPC Web Portal	NICE EnginFrame 2017.2
User Authentication	Active Directory

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