Exploring the cloud

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Balena HPC

- free-at-the-point-of-use and premium SLAs
- dedicated batch, shared interactive & visualisation
- 1,200 users from 16 out of 18 depts
- top4 depts: chemistry, physics, maths & chemical engineering
- approx. 200 unique applications/modules
- last 12 months:
  - 88% batch utilisation
  - 140 unique users per month
  - 20 new users per month
  - ~50% usage =<1 node

	Intel Ivybridge E5-2650v2	Intel Skylake Gold 6126
# nodes	196	17
# CPU cores	3,136	408
Memory per node	64GB, 128GB, 512GB	192GB
Accelerators	Nvidia K20x & P100, Xeon Phi	
Network	Intel TrueScale 40Gbit/s	
Storage	0.6PB BeeGFS scratch	

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Also have access to…

JADE 2
Tier 2 HPC

Isambard 2

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So what’s next?

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Our goals

- Continued increase of user base and domains using HPC
- Grow the number of inter-department collaborations
- Make our researchers more productive

Other influencers:

- Growing expectation within Bath to use cloud
- Enterprise infrastructure is beginning to move to Azure
- IT is refocusing around DevOps

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Known unknowns

What are the costs?

What will happen to my data?

Cost of moving data?

How will the HPC service model change?

How can we manage budgets?

How will this impact grant and non-grant funded research?

How can negative consequences be avoided or mitigated?

What is the best way support researchers in the transition period?

What are the barriers to entry for the proposed system?

What will the potential collaboration with a cloud supplier look like?

Is it as easy to justify investment in cloud as in physical infrastructure?

Will the new service must be at least as good as it is now?

Will the service be available to all?

Will the service must be secure?

Will the cloud be integrated with research storage?

How far can I scale my code/models within the cloud?

How does cloud support my goals?

Does cloud offer value for money?

Can we trust public cloud providers?

How can cloud help transform my research?

What are the potential compliance issues with data rules (e.g. GDPR)?

What are the data transfer speeds to the cloud?

What is the performance of the cloud like?

Is there a performance hit?

Who else has moved to cloud?

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Let’s run a pilot

- Focus on end-user experience
- How can costs and budgets be managed, controlled and charged correctly
- Comparison of on-premise and cloud TCO models
- How to incorporate cloud costs and charges on to research grants
- Investigate impact on internal processes, policies, procedures and integration with enterprise environment
- Test stability, reliability, resilience, reproducibility and performance of a cloud platform
- Understand staffing and training implications
- Discover any new unknowns?

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What are we doing?

- Running a pilot project with Red Oak Consulting
- Standing up 8-10 different types of real workflows in Azure
- Based on HPC, HTC, visualisation
  - From a general fixed-capacity HPC service to a fully scalable service
- Using Microsoft Azure – Intel Skylake (Hc), AMD Rome (Hb) and AMD Milan (Hbv2)
- Understanding how we can manage costs and budgets
- Produce synthetic reports and bills for internal charging

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Microsoft Azure

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What have we learnt so far?

- Stakeholder engagement, everyone needs to be part of this journey
- Interesting clauses in software agreements
- Delays in cost reporting and ability to map true costs to workloads

- Expecting more lessons to be learnt….

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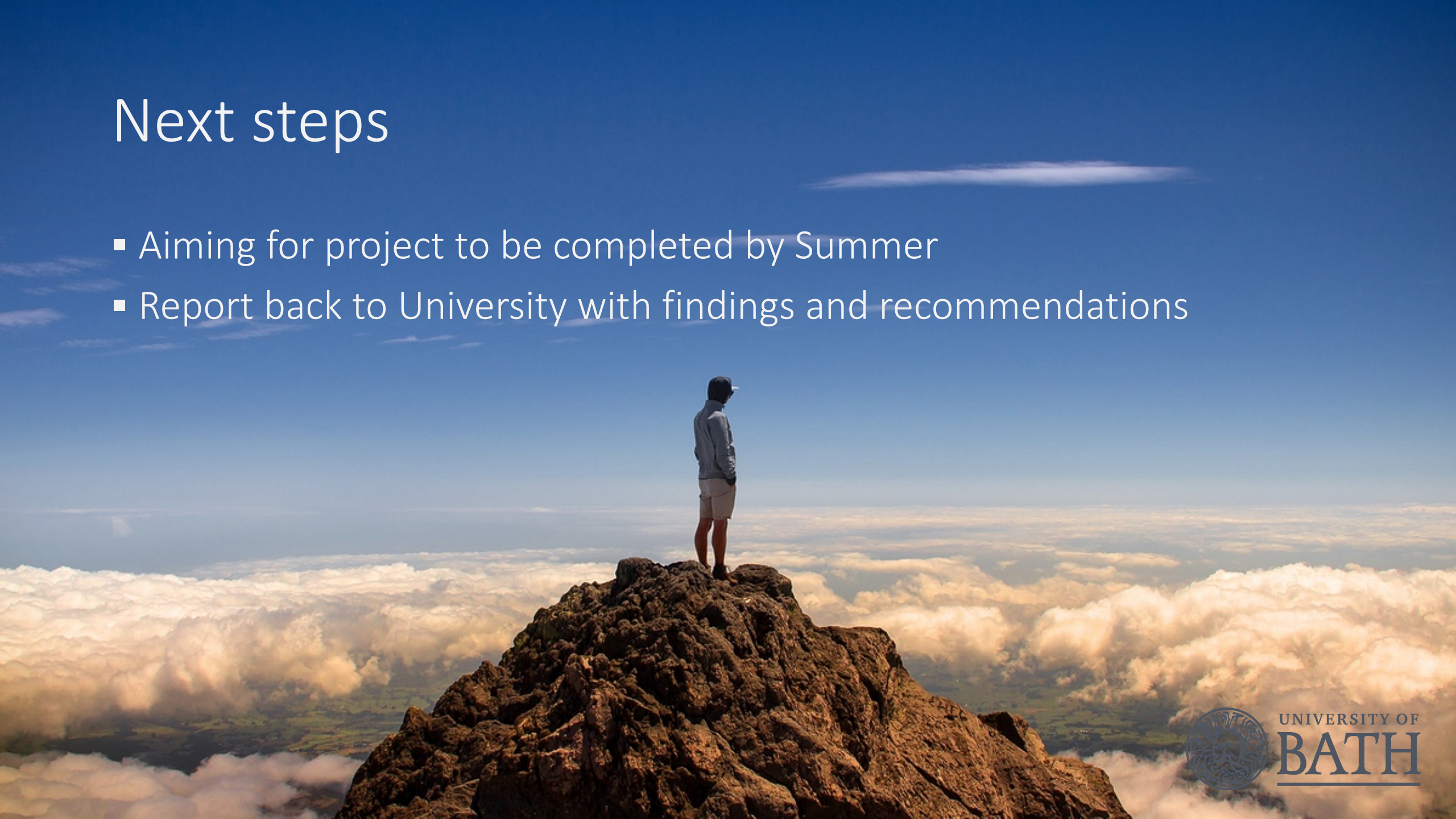
Next steps

- Aiming for project to be completed by Summer
- Report back to University with findings and recommendations



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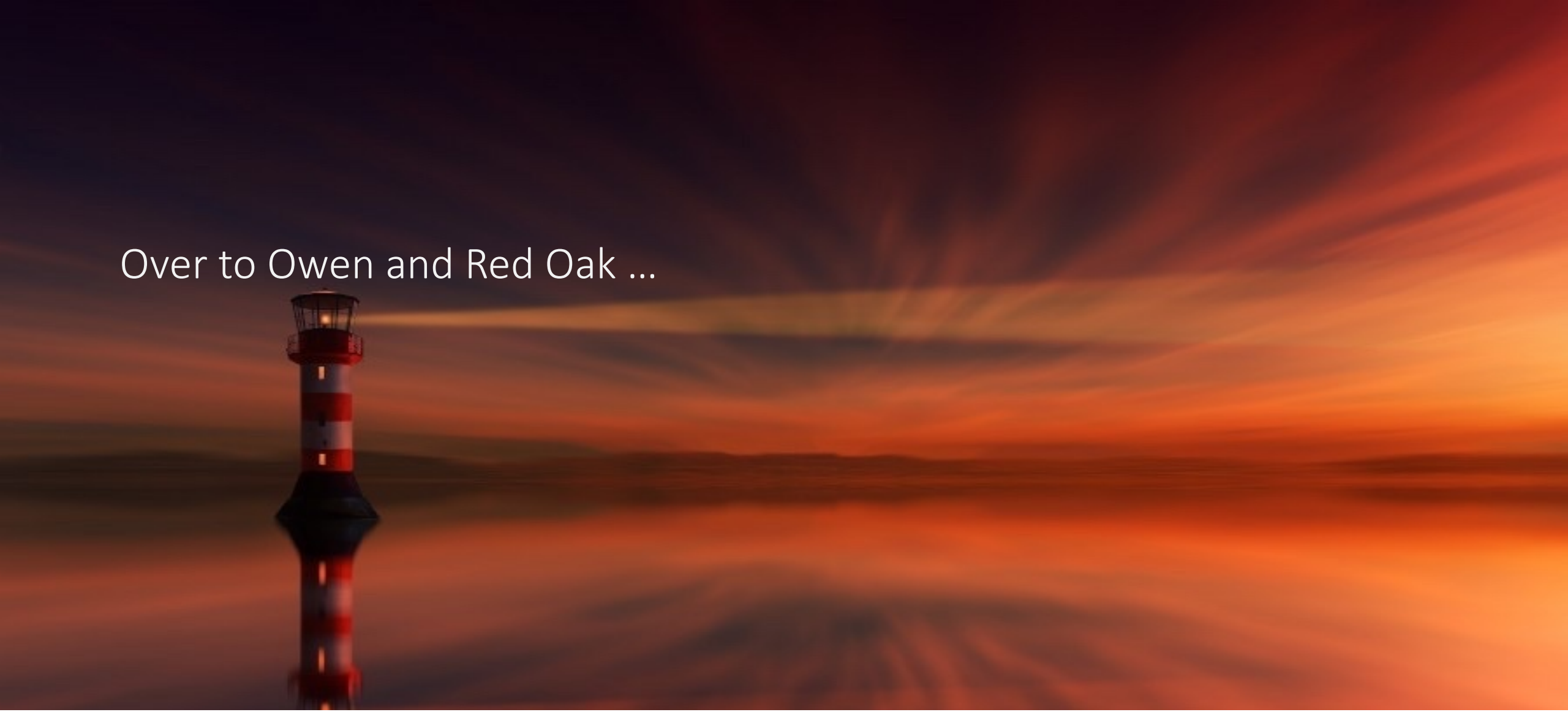

Over to Owen and Red Oak …

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