Windows HPC Server 2008 R2 – Service Pack 3 (V3 SP3)

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HPC Server Components

Job Scheduler	Distributed Runtimes	System Administration
• Job submission APIs and portal • Job queue and priorities • Task activation and monitoring • Resource sharing policies	• Parametric Sweeps • Cluster SOA • Excel • MPI	• Cluster deployment • Monitoring • Diagnostics • Reporting

HPC Target Deployments

On Premise

- Dedicated Compute Nodes
- Workstation Nodes
- Server Scavenging

Hybrid

- On premise cluster
- Burst to Azure

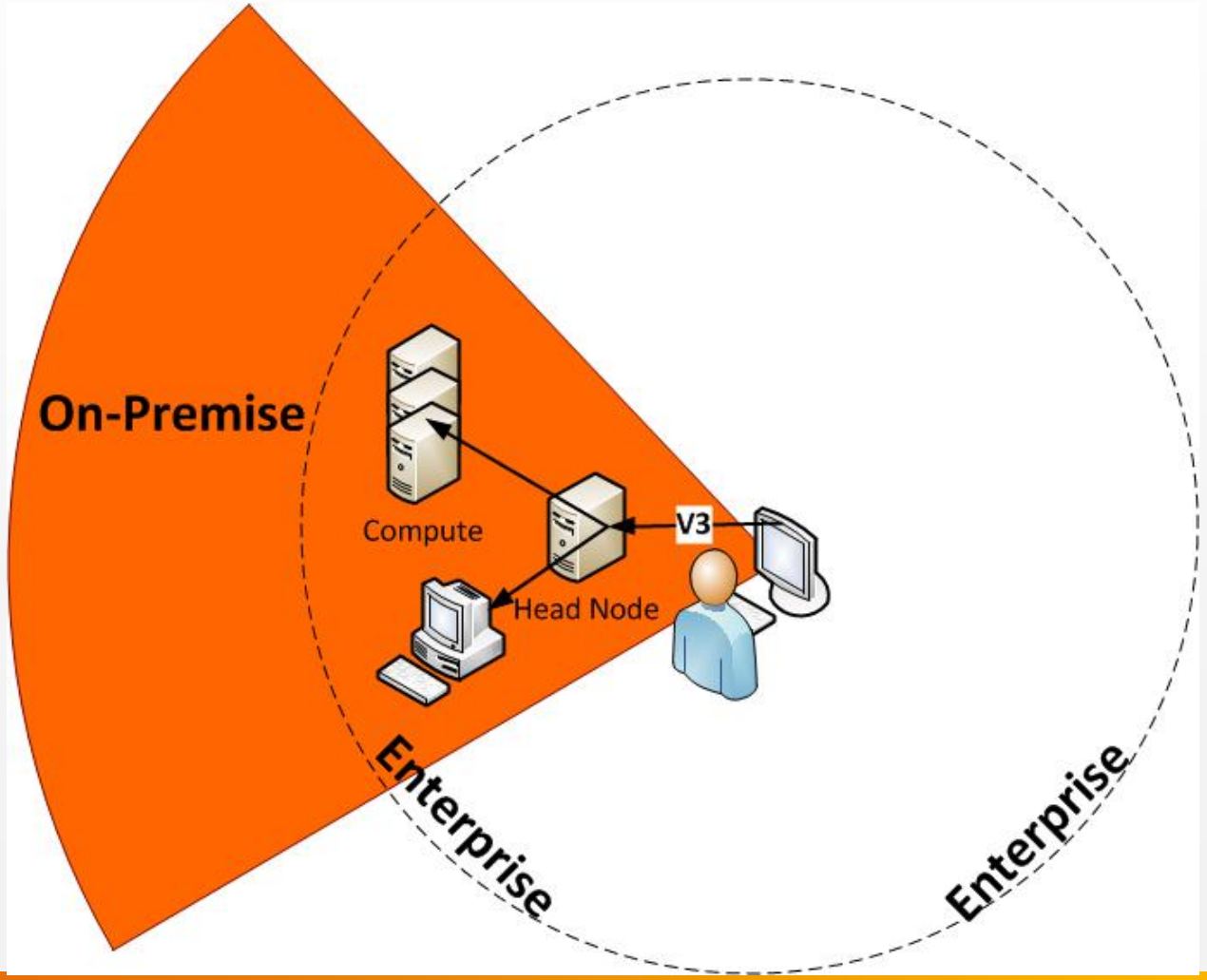
Cloud

- Application offload to Azure
- Applications and services in Azure
- Cluster in Azure

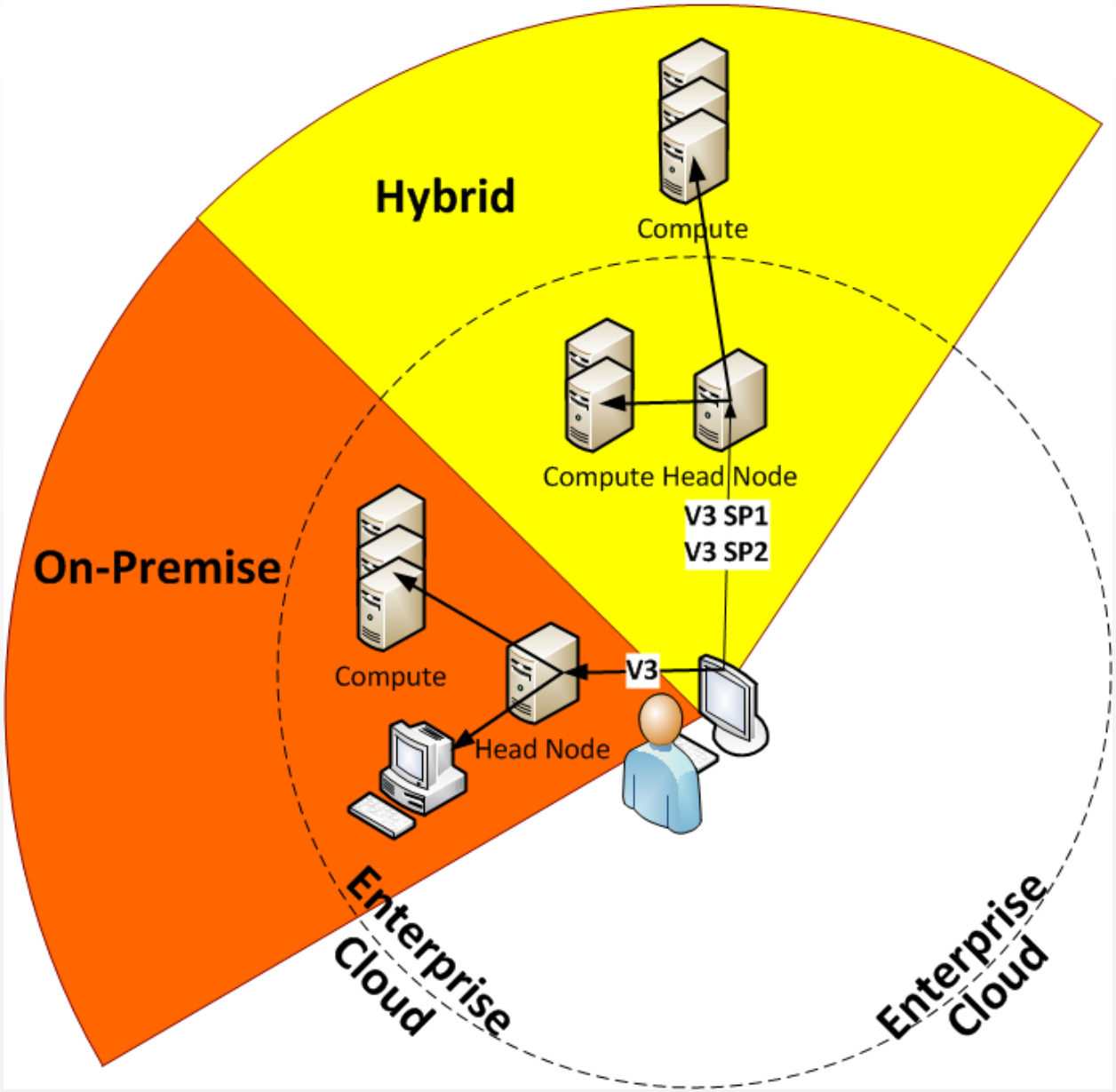
HPC supports all three environments.

Aggressively support the new cloud business model while continuing to invest in on-premise and a melding of the on-premise and cloud models.

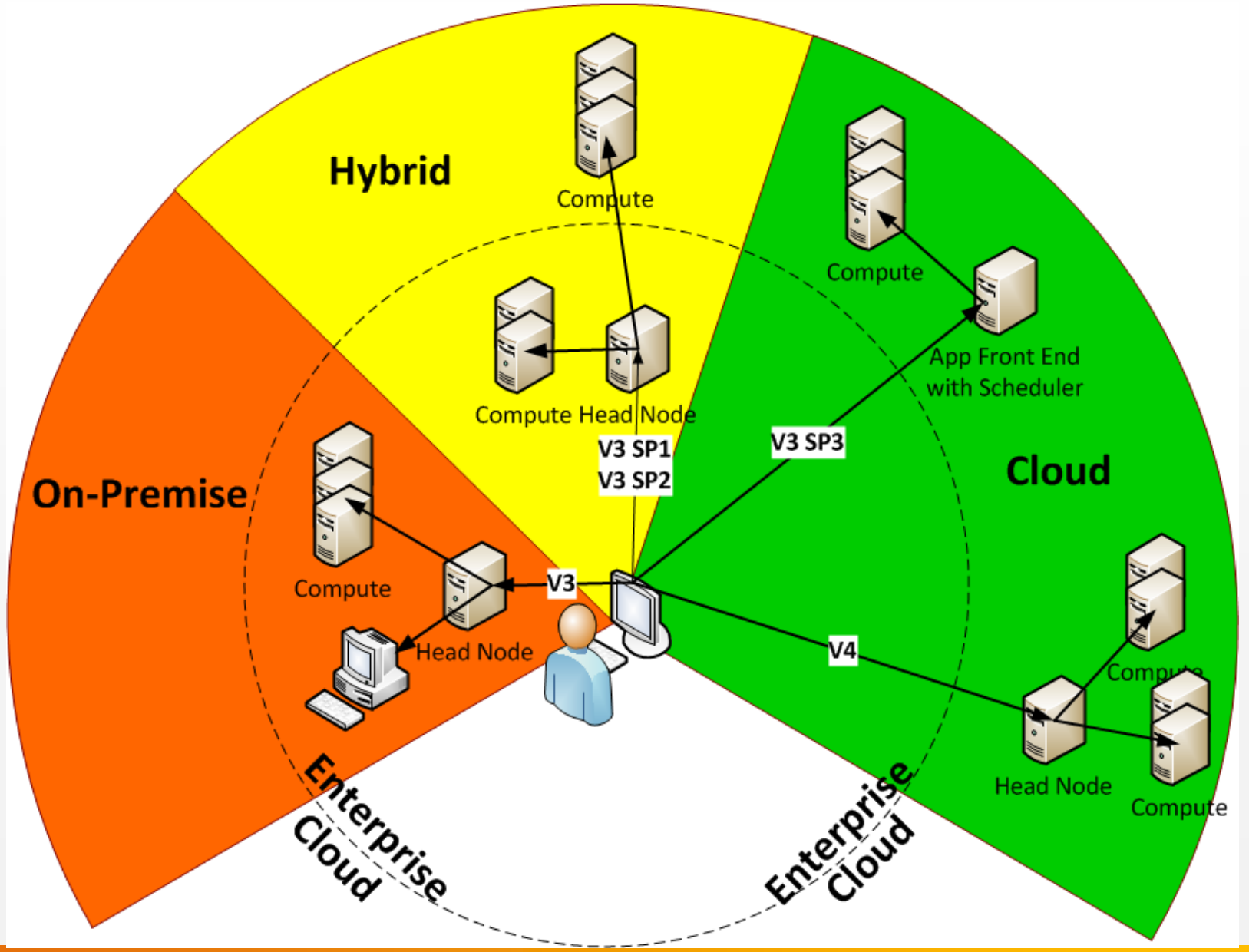
Windows HPC Server 2008 R2



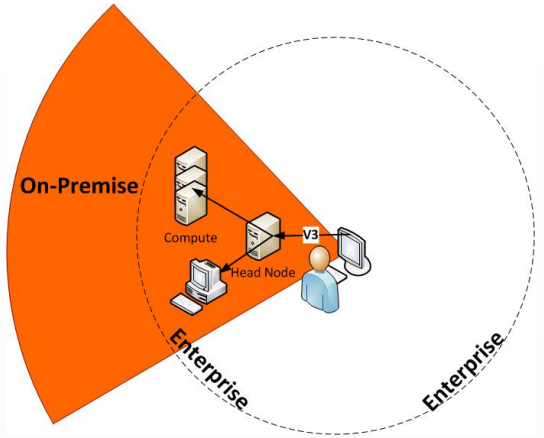
Windows HPC Server 2008 R2 SP1 & SP2



Windows HPC Server 2008 R2 SP3



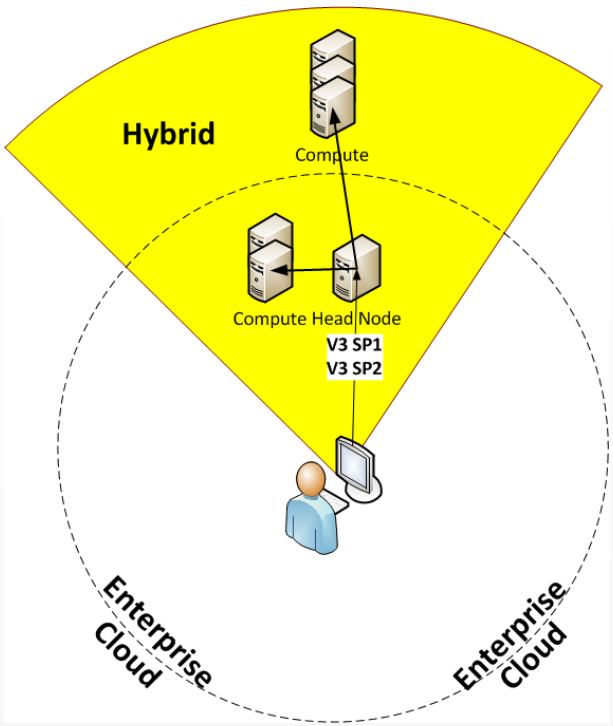
On-Premise



- Traditional HPC environment
  - Dedicated compute nodes
  - Workstation nodes (CoW) & Server Scavenging
  - Supports specialized hardware (Infiniband, GPU, etc.)
- On-premise head node and broker nodes
  - Administration- deployment, monitoring, diagnostics, & reporting
  - Scheduler – FCFS, Balanced, Pools, Preemption
  - Runtimes - Parametric sweep, MPI, SOA, LINQ to HPC

Hybrid

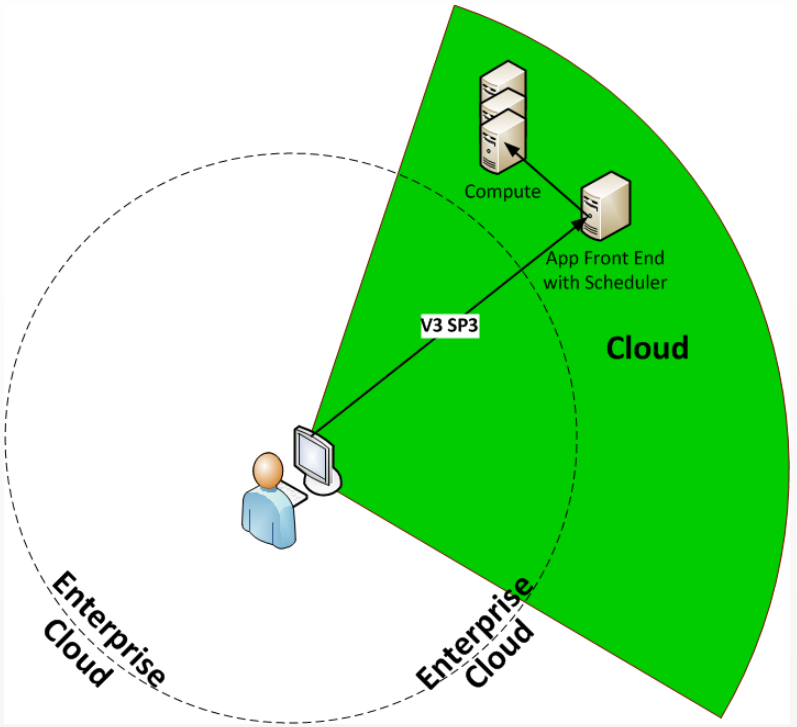
- Combine power of on-premise compute resources with scale-out capability of Azure.
  - Cluster burst to Azure –
  - Add cloud resources as necessary
    - Worker Roles
    - VMs
- On-premise head node & broker nodes
  - Full Admin and Scheduler capabilities
  - Work (jobs/tasks) pushed to Azure nodes when available
  - Workloads: parametric sweep, MPI, SOA



Cloud - Applications in Azure

November 2011

- Application in hosted entirely in Azure
  - No on-premise Head Node
- Application is accessed from
  - Rich client on premise
  - Portal
  - Web Application
- Multiple business models
  - Packaged application is sold to a customer
  - Application is available as a service in the cloud
- Scheduler and Runtimes Supported in Azure
  - Workloads: Parametric Sweep, SOA, MPI, HPC to LINQ
  - No Head Node (Scheduler Service, no Admin Services)



Components in Azure SDK

Job Scheduler

- Job submission API and portal
- Job queue and priorities
- Task activation and monitoring
- Resource sharing policies

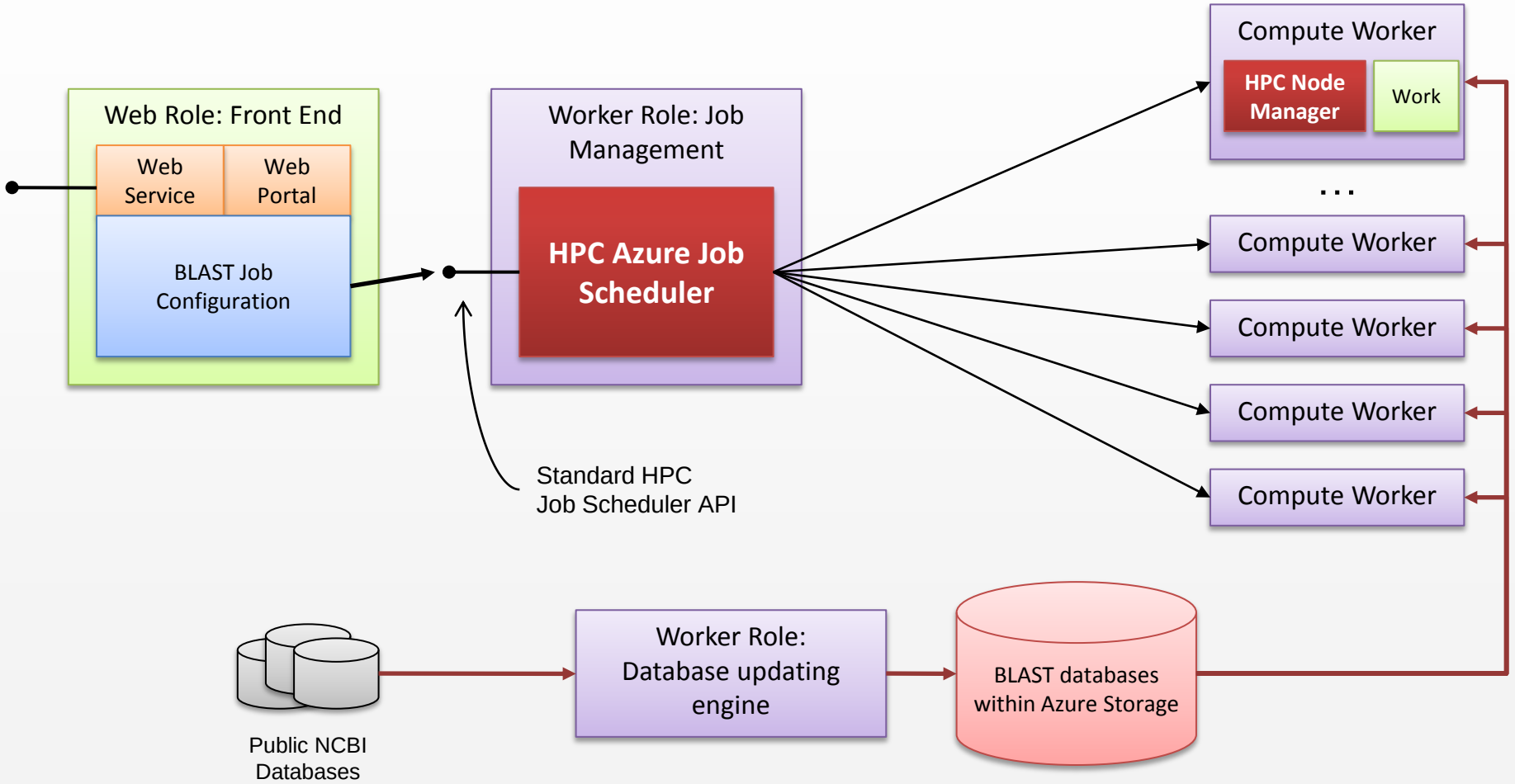
Distributed Runtimes

- Parametric Sweeps
- Cluster SOA
- Excel
- MPI

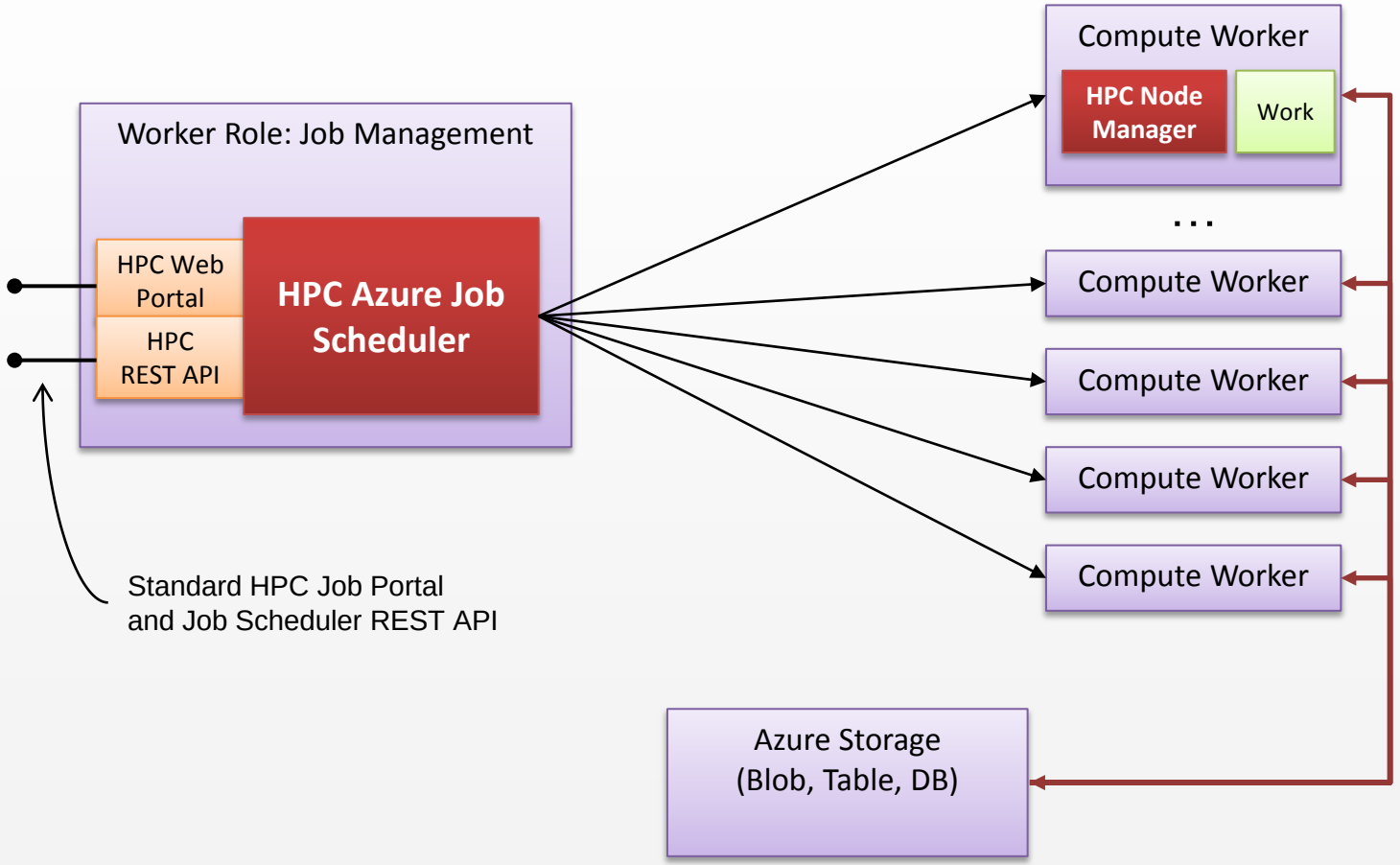
System Administration

- Cluster deployment
- Monitoring
- Diagnostics
- Reporting

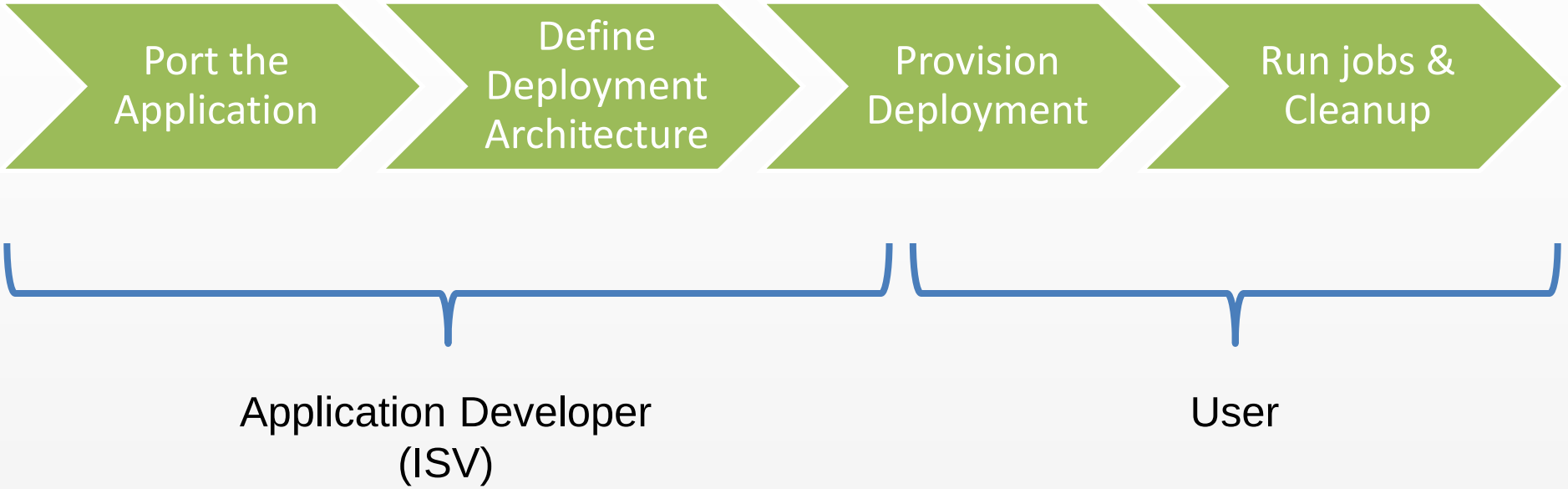
Sample: AzureBLAST With HPC Scheduler in Azure



Sample: Using HPC Portal or REST API



Building an Application Deployment
Packaged Application

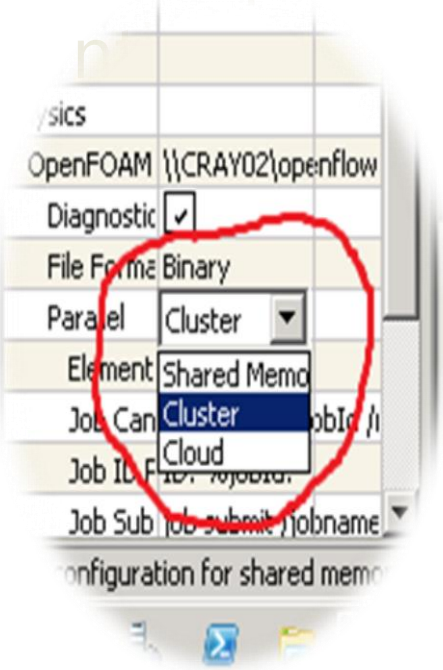


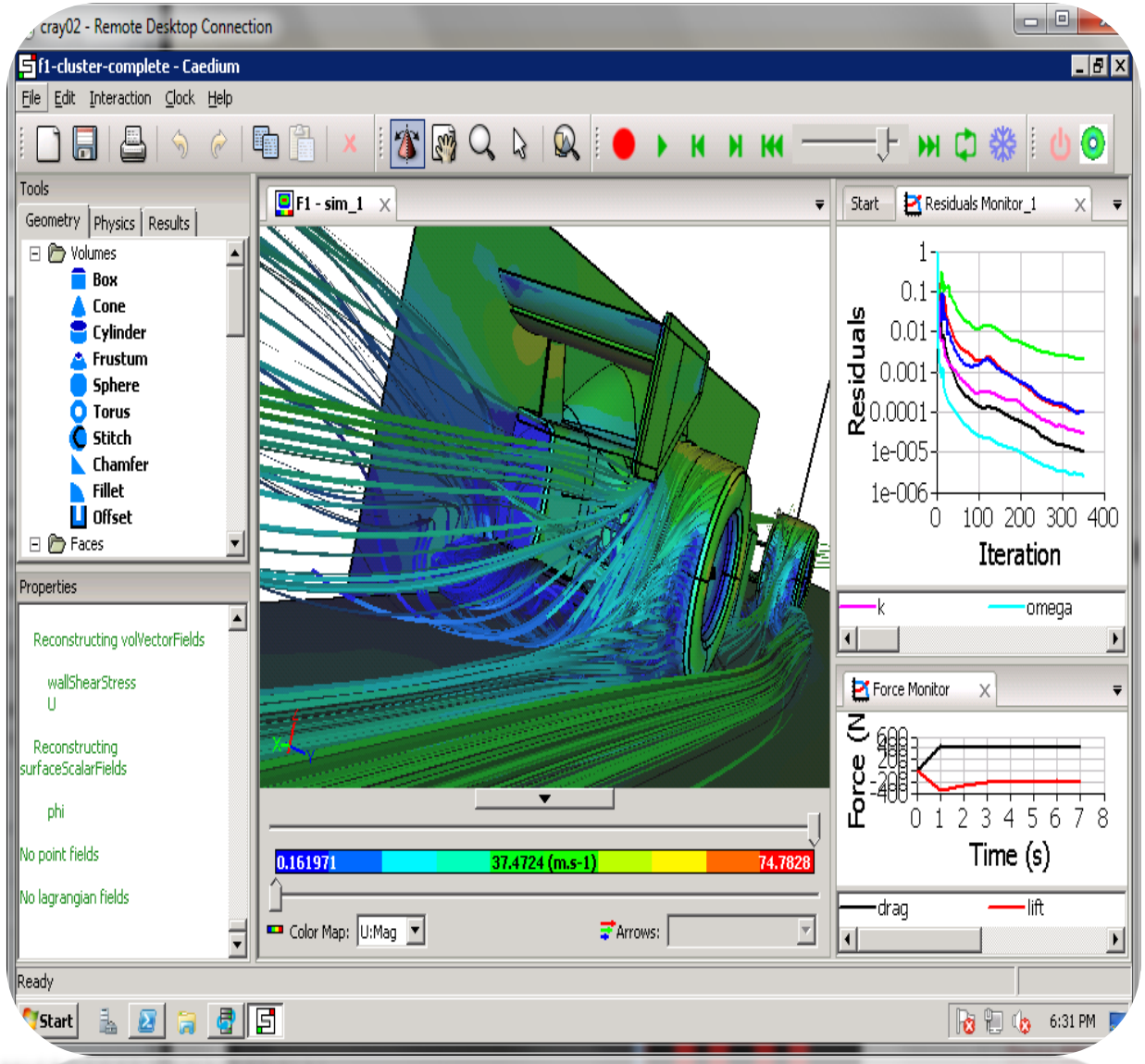
Simplicity of Microsoft HPC Compute Intensive Paradigms

Run on:

- Client
- Cluster
- Cloud

Transpare





– INTERNAL ONLY

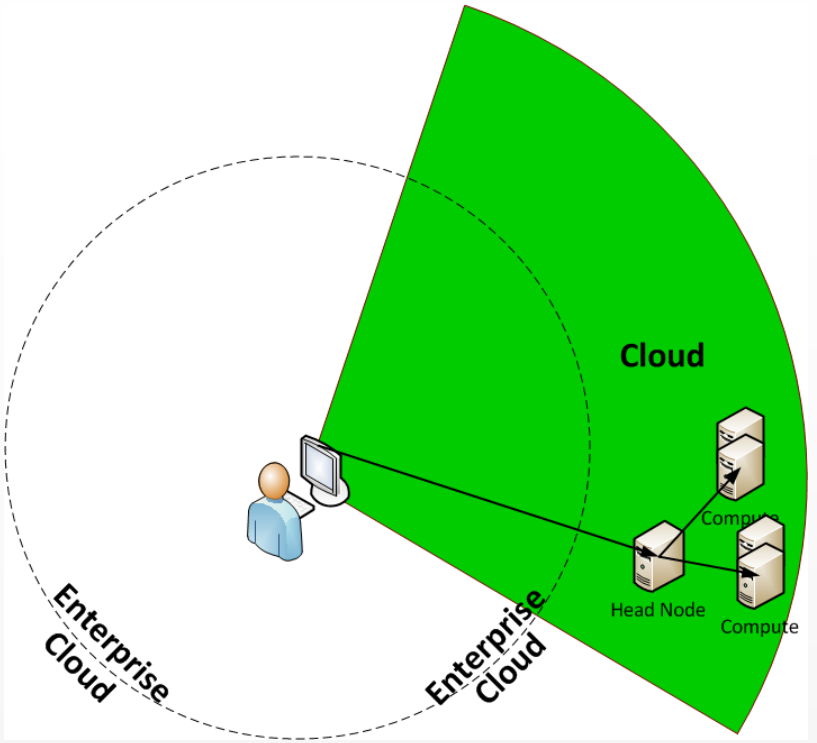
Business Model

- An Application or a Service
  - Who owns the Azure subscription & deployment?
- Licensing
  - On-premise license server or cloud license server
  - How will license models change?
- Billing
  - Currently no support for billing on behalf of an ISV

Cloud - Cluster in Azure

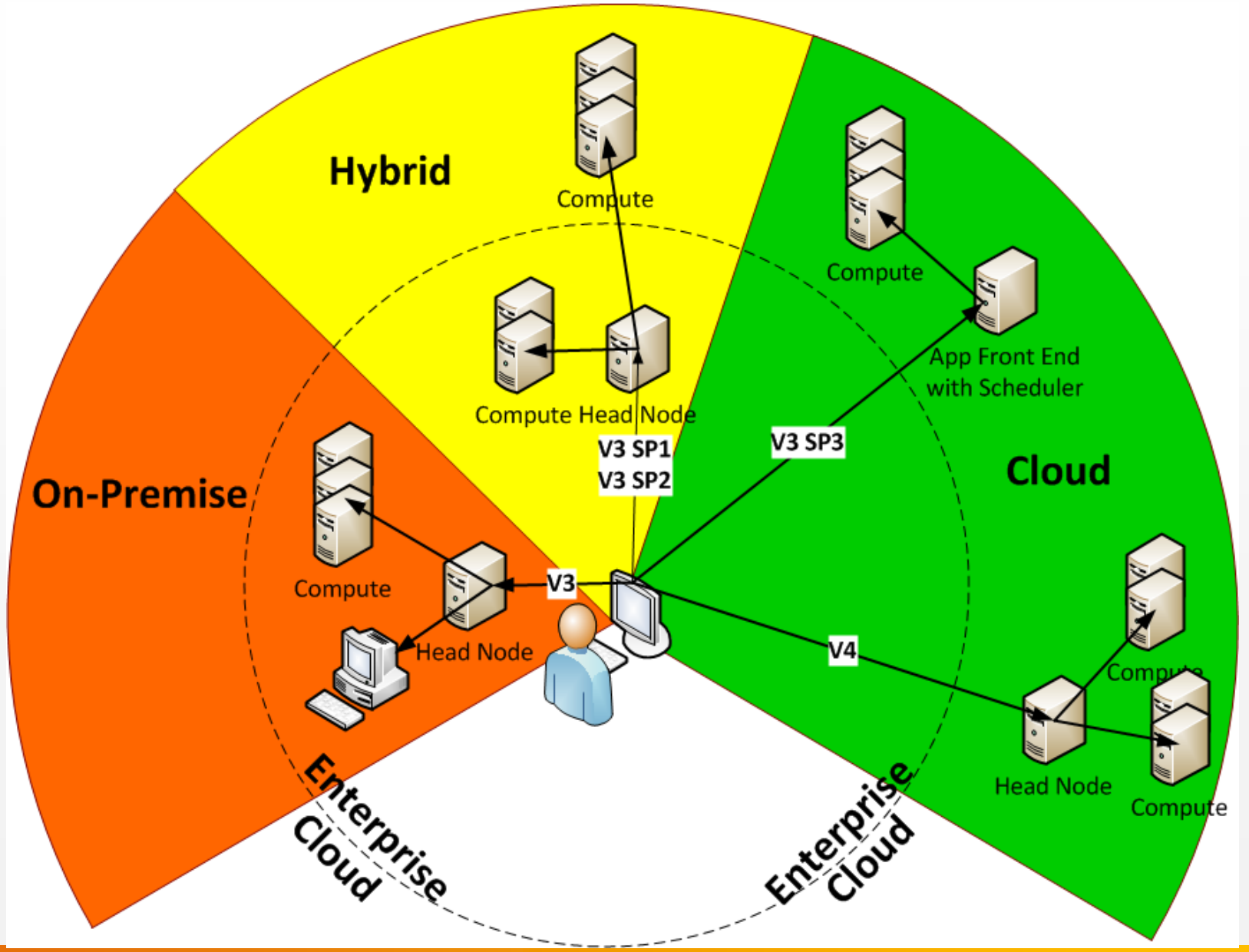
Future

- Cluster hosted entirely in Azure
  - Full Head Node (Admin & Scheduler)
- Jobs submitted to scheduler just as on premise
  - Portal
  - Web Application
  - APIs



- IT Pro model just as on-premise cluster
- Scheduler and Runtimes Supported in Azure
  - Scheduler: Policies similar to on-premise & additional cost based policies.
  - Workloads: Parametric Sweep, SOA, MPI, HPC to LINQ
  - No Head Node (Scheduler Service, not Admin Service)

Windows HPC Server



Questions?