Microsoft

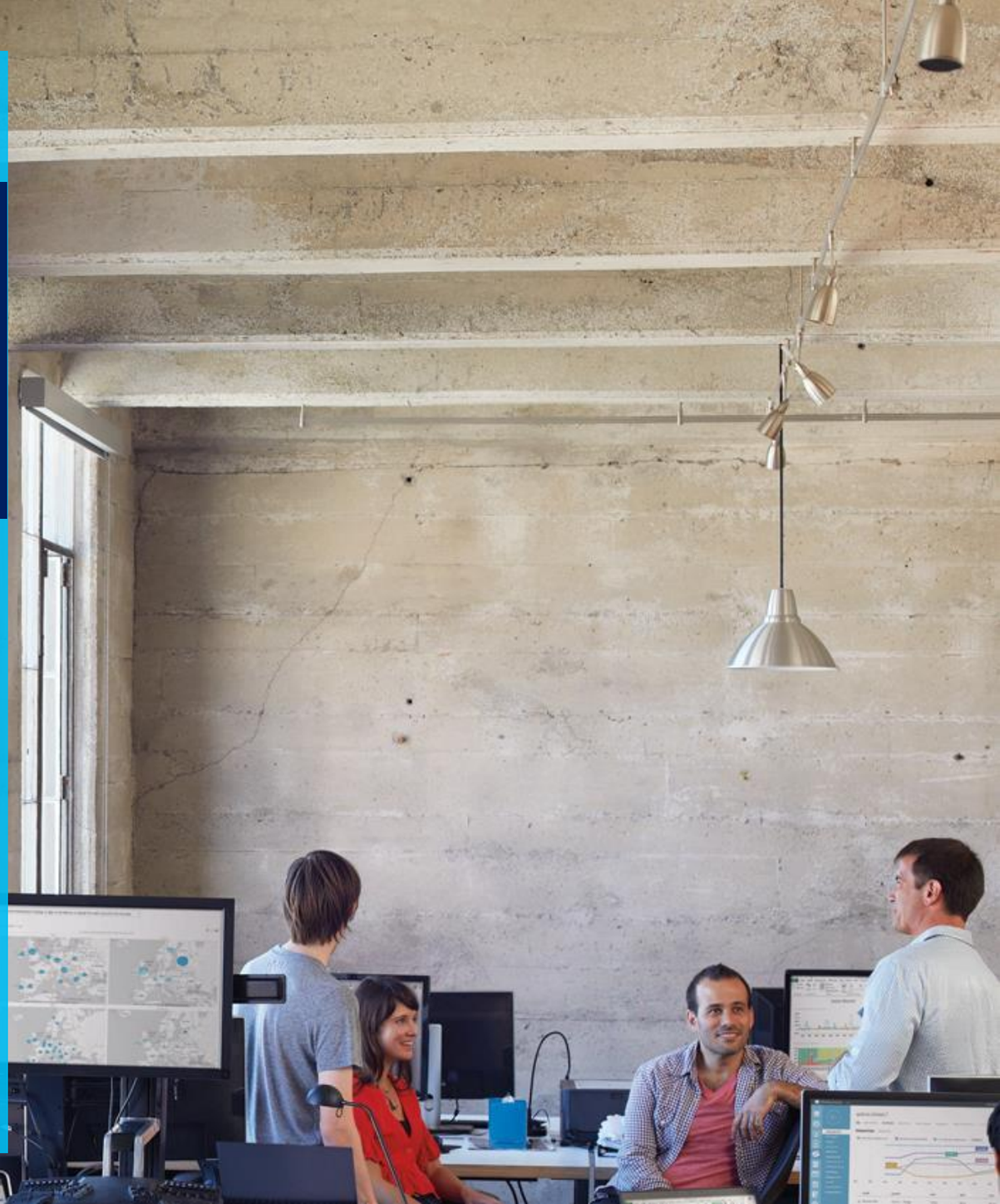
Microsoft Azure Power Lunch

Today's Topic:
Azure Batch Service Updates

Series website: http://azurepowerlunch.com/

On-Demand Session Information (Recordings) are available here:
Azure Power Lunch YouTube Channel

Date: 8th April 2022



Naveed Zaheer – Cloud Solution Architect



- Been with Microsoft for more than 18 years and in software industry for more than 27 years
- Spent 10+ years with Microsoft Consulting Services in areas such as AppDev, Distributed Applications, SOA and Cloud Applications
- Working with Azure since its inception
- Currently in a Cloud Solution Architect role

Agenda

Quick Overview of Azure Batch Service

Key Use Cases and Scenario

Key Updates
- Spot Instance Support
- Private Link Support
- Simplified Node Communication Model

Demo

Q & A

Azure Batch Service in a Nutshell

Platform service providing easy job scheduling and cluster management, allowing applications or algorithms to run in parallel at scale

- ✓Capacity on demand; jobs on demand
- ✓Install and run the applications; new or existing applications
- ✓Efficient - scale according to load; start work when first VM available; no head-node
- ✓Pay for use - by the minute
- ✓Scale - 1 to 100's VMs for a cluster
- ✓Choice – Use any VM according to job and application requirements; Windows or Linux
- ✓No need to install or manage cluster software
- ✓Cost effective – no charge for Batch, only pay for consumed resources

If a solution requires VMs and a queue to run apps, then Batch should be a great fit

What does Azure Batch do?

Platform service for developers providing job scheduling and VM management as a service, allowing applications to be run in parallel at scale

Batch Pools

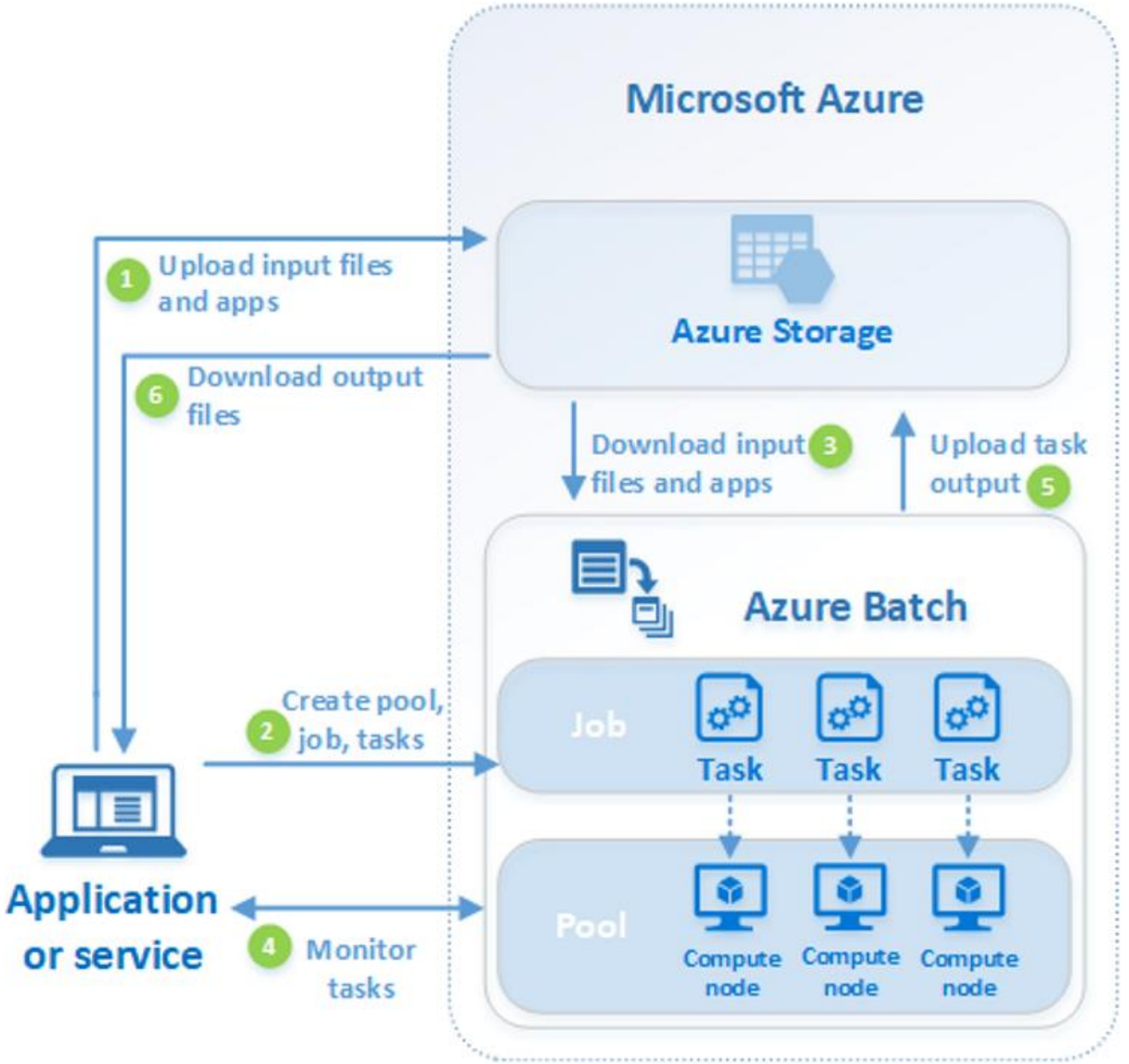
- Configure and create VMs to cater for any scale
- Scale the number of VMs up or down automatically
- Pick the VM size and spec most suited to your application and required performance

Price

No charge for Batch itself; pay for underlying compute VM's, networking, storage

Azure Batch Service – How it works?

Step
1. Upload **input files** and the **applications** to process those files to your Azure Storage account.
2. Create a Batch **pool** of compute nodes in your Batch account, a **job** to run the workload on the pool, and **tasks** in the job.
3. Download **input files** and the **applications** to Batch
4. Monitor **task execution**
5. Upload **task output**
6. Download **output files**



Key Use Cases and Scenarios

Media transcoding

Media Services - audio and video transcoding, etc.

TV Everywhere – video transcoding using ffmpeg

Rendering

Engineering companies rendering pipeline using 3DSMax and V-Ray on Linux VMs

Test execution

Financial risk analysis testing

Risk analysis

Insurance and financial services

Deep Learning

Use CNTK, Caffe, TensorFlow, Torch, etc.

Data ingestion and processing

Nightly data ingestion and processing of automotive data

Pricing models

Energy pricing using python Monte Carlo quant models

R and Spark models for hotels

Engineering simulations

Engineering ISV customers can run apps at scale

Image processing

Analyze MRI scans for sign of dementia

Misc.

Tracking drug company spending against doctor prescriptions

Aircraft route optimization and simulation

Demo

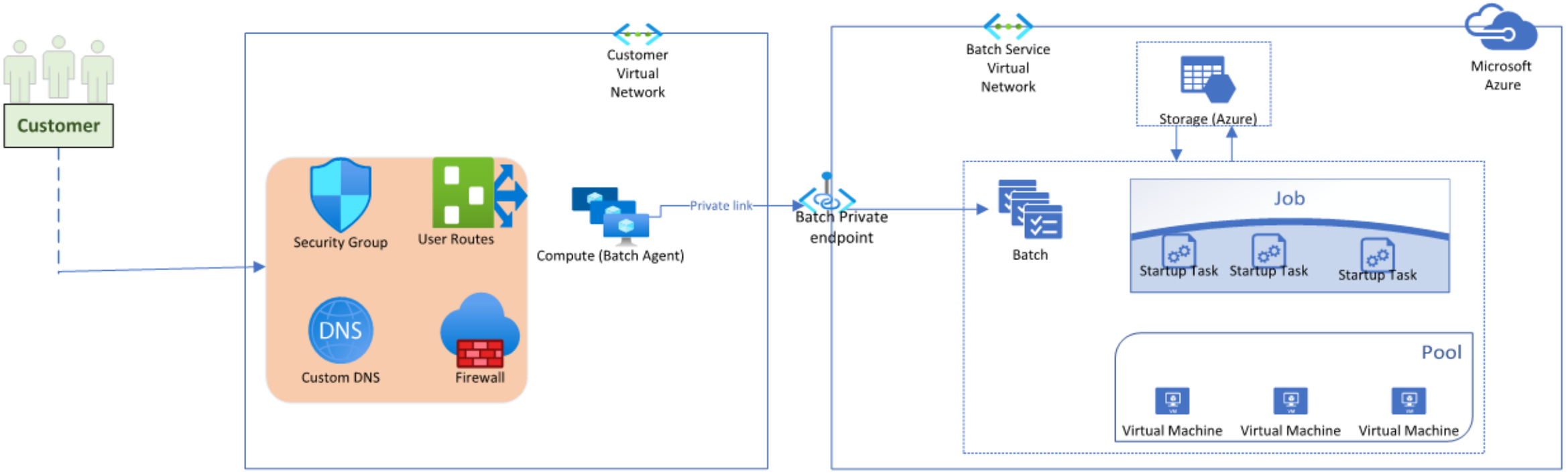
Batch support for Spot VMs

- Batch pools can contain both dedicated VMs and Spot VMs.
- You can also configure a pool to completely use Spot VMs to run jobs as cheaply as possible but spin up dedicated VMs if the capacity drops below a minimum threshold, to keep jobs running.
- Batch pools automatically seek the target number of Spot VMs. If VMs are preempted or unavailable, Batch attempts to replace the lost capacity and return to the target.
- When tasks are interrupted, Batch detects and automatically requeues tasks to run again.
- Spot VMs have a separate vCPU quota that differs from the one for dedicated VMs. The quota for Spot VMs is higher than the quota for dedicated VMs, because Spot VMs cost less.

Batch support for Spot VMs – Use Cases

- **Development and testing:** In particular, if large-scale solutions are being developed, significant savings can be realized. All types of testing can benefit, but large-scale load testing and regression testing are great uses.
- **Supplementing on-demand capacity:** Spot VMs can be used to supplement regular dedicated VMs. When available, jobs can scale and therefore complete quicker for lower cost; when not available, the baseline of dedicated VMs remains available.
- **Flexible job execution time:** If there is flexibility in the time jobs have to complete, then potential drops in capacity can be tolerated; however, with the addition of Spot VMs jobs frequently run faster and for a lower cost.

Private Link Support for Azure Batch



Private Link Support for Azure Batch - Limitations

- Private endpoint resources must be created in the same subscription as the Batch account.
- To delete the private connection, you must delete the private endpoint resource.
- Once a Batch account is created with public network access, you can't change it to private access only.
- DNS records in the private DNS zone:
  - DNS records are not removed automatically when you delete a private endpoint or when you remove a region from the Batch account.
  - You must manually remove the DNS records before adding a new private endpoint linked to this private DNS zone.
  - If you don't clean up the DNS records, unexpected data plane issues might happen, such as data outages to regions added after private endpoint removal or region removal.

Simplified Compute Node Communication Model

The new communication method reduces the complexity and scope of inbound and outbound networking connections required in baseline operations.

Present Model - Network Security Group (NSG) Rules

- Inbound:
  - Destination ports 29876, 29877 over TCP from BatchNodeManagement.*region*
- Outbound:
  - Destination port 443 over TCP to Storage.*region*
  - Destination port 443 over TCP to BatchNodeManagement.*region* for certain workloads that require communication back to the Batch Service, such as Job Manager tasks

Simplified Model - Network Security Group (NSG) Rules

- Inbound:
  - None
- Outbound:
  - Destination port 443 over TCP to BatchNodeManagement.*region*

Resources

- What is Azure Batch?
- Use Spot VMs with Batch
- Use private endpoints with Azure Batch accounts
- Use simplified compute node communication

Q & A