Azure Infrastructure Operations:  
Whiteboard Design Session Student Guide

Intelligent Cloud Virtual Bootcamp 2020

# Learning Objectives

# Customer Background

Contoso Cloud Services (CCS) is a Microsoft Partner providing a broad portfolio of cloud-focused IT solutions to its customers.

CCS was founded in Atlanta in 1998, originally as Contoso IT Services. The original business successfully rode the dot-com bubble, creating and hosting web sites as customers established their on-line presence. The hosting side of the business grew into a substantial managed services business, with CCS building hosting facilities in Atlanta, New York, Denver and San Jose.

The CEO of CCS, Jack Walsh, was quick to recognize that the dawn of the cloud era would be transformative for his industry. In 2015 he re-branded the company as Contoso Cloud Services and set in place a new business strategy offering cloud-based and hybrid cloud services. Given CCS’s long history as a Microsoft partner, Microsoft Azure was the natural choice as preferred public cloud provider.

CCS has built a broad base of around 600 managed services customers, mostly medium-sized and large businesses. More recently CCS has also acquired a handful of enterprise customers, reflecting the company’s ongoing growth and success.

# Technical Background

The current CCS portfolio of managed customer applications comprises:

* Legacy on-premises applications hosted in CCS’s four datacenters. The strategy is to migrate these solutions to cloud-based alternatives as hardware ages, and eventually to reduce the datacentre footprint from 4 sites to 2.
* Hybrid solutions, using an 200Mbps ExpressRoute connection supplied by the existing CCS WAN provider
* Cloud-only customer solutions. These comprise both IaaS solutions (mostly arising from lift-and-shift migrations) and a smaller but growing portfolio of modernized PaaS-based applications.

CCS is a direct CSP. CSP Azure subscriptions are used by most customers. However, some customers are using pay-as-you-go subscriptions which they acquired before engaging CCS, and their enterprise customers use EA subscriptions.

# Current Situation

As head of Cloud Operations for Contoso Cloud Services, you are responsible for keeping all your in-house and customer managed services healthy, secure and available 100% of the time. As your cloud business grows, you need to scale your operations activities accordingly—but you can only use the resources your already have.

Currently, your team manages each customer and application individually--so as the number of customers and applications grows, so does your workload. Pretty soon, the team aren't going to be able to cope. The only solution is to improve your teams' efficiency.

Your challenge is to redesign your operations processes for horizontal scale. You need to create efficient processes that enable your team to deliver core operations scenarios—such as health alerts, dashboards, backup and patching—across your growing customer base.

# Pain Points

1. Access to customer subscriptions uses a combination of CSP ‘Act On Behalf Of’ (AOBO) and AAD B2B Collaboration. Managing access as team members change is a challenge, and some enterprise customers are disgruntled at the overhead on their side of managing changes to B2B guest accounts.
   1. SOLUTION: Lighthouse / Marketplace Managed Services Offering
2. A key part of CCS’s offerings is backup management. CCS uses Azure Backup for backup of both on-premises and cloud-based servers and databases. Backup monitoring and management is a growing time sink for the operations team. In a recent incident it was found that backup jobs had been failing on one customer application for the past 2 months. Alerts had failed due to a missing diagnostics logging configuration. No one knows how many other applications are similarly affected.
   1. SOLUTION: Backup Explorer / Backup Reports, using Lighthouse for cross-tenant single-pane-of-glass view. Use built-in policies to ensure new RSVs are on-boarded to Log Analytics automatically, and compliance reports to check nothing missed and remediate existing RSVs. Also use policy to ensure VMs are onboarded for backup. Automate deployment of alerts using templates/IaC.
3. CCS are using System Center for patch management for both on-premises and cloud-based servers. Their goal is to deprecate System Center in favour of a cloud-based alternative. This must provide comprehensive coverage across their entire server estate (on-premises/cloud, Linux/Windows).
   1. SOLUTION: Azure Update Management. Auto-onboarding of Azure VMs via policy or Security Center. On-premises on-boarding via WAC.
4. CCS are managing a large number of VMs across their customer subscriptions. VM diagnostics and monitoring has been configured for each application over time, using a variety of approaches. These include Azure metrics, diagnostics storage accounts, and Log Analytics. CCS would like to settle on a unified approach to server monitoring across their entire estate, including on-premises machines.
   1. SOLUTION: Azure Monitor VM Insights. Provides comprehensive logs/metrics/alerts. Deploy to all Azure VMs using policy/remediation. Can also deploy to on-premises machines. As a bonus the service map dependency view will help with their migration planning.
5. CCS have used Azure Dashboards to build per-application views of key performance and health metrics. They find dashboards restrictive and as their customer base has grown, there are now too many dashboards to manage and monitor. They are looking for a more flexible and scalable approach that can aggregate data from all applications into a single view, and highlight ‘hot’ metrics arising from any of their managed servers
   1. SOLUTION: Can run queries to create dashboards and alerts across multiple workspaces, but limited to 100 workspaces – will have to partition customer base (E.g. EA, west/east, whatever)

Azure Monitor Workbooks  
Automation (for some tasks)

Alerts, inc alerts from log queries

# <https://www.wesleyhaakman.org/azure-lighthouse-resource-graph-dashboards/>