Cognizant CLOUD SERVICES

Blueprint – Azure Service Bus

Revision History

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1. Scope

This document provides the blueprint for the Service Bus offered by Azure. This contains the below.

1. Service Usage
2. Provisioning Scripts
3. Support Objectives
4. Monitoring metrics
5. Monitoring Setup Scripts

2. Overview

Microsoft Azure Service Bus is a fully managed enterprise integration message broker. Service Bus is most commonly used to decouple applications and services from each other, and is a reliable and secure platform for asynchronous data and state transfer. Data is transferred between different applications and services using messages. A message is in binary format, which can contain JSON, XML, or just text.

Service Bus supports two distinct messaging patterns: Azure Relay and Service Bus Messaging. See the following link for more details: https://docs.microsoft.com/en-us/azure/service-bus-messaging/service-bus-messaging-overview

3. Service Usage

3.1 Best Practices

- If Data Contract Serialization is being used to construct Queue messages, it is recommended to use Binary serialization over Xml serialization, as the former is more efficient in case of a Service Bus Queue
- Recommended to use unique keys per publisher or consumer
- Data within Service Bus to encrypted at transit and rest.

3.2 Microsoft SLA

99.9%

3.3 Technical Limitations

Geo Disaster Recovery is available in premium tier only.

3.4 Service Connectivity

IP Filtering can be enabled, so as to ensure that the requests come from known IP addresses only.

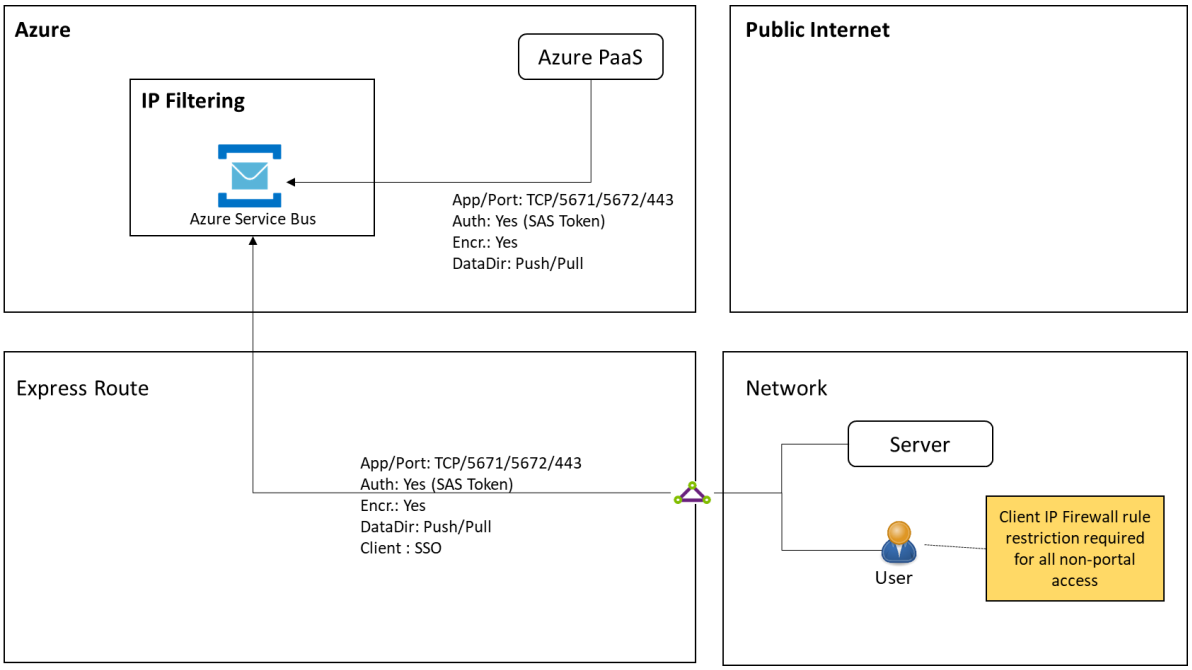
3.5 Recommended tiers for enterprise usage

Basic, Standard & Premium.

3.6 Additional Notes

- Maximum Message size limitation of 256 KB (for Basic / Standard tier) and 1 MB (for premium tier)
- Maximum Message Header size of 64 KB
- Maximum Queues / Topics per namespace - 10,000
- Maximum subscriptions per topic - 2,000
- Maximum number of correlation filters per topic - 100,000
- Maximum concurrent connections on a queue, topic or subscription - 100
- Maximum number of basic / standard Service Bus namespaces in an azure subscription - 100
- Geo Replication is available for metadata only.

3.7 Service Usage Diagram



4. Provisioning Script

The below ARM template is to be used to provision an instance of the service.

This consists of the below parameters

Parameter Name	Description
ServiceBusNamespaceName	Name of the Service Bus Namespace
SkuTier	Name of the Service Tier

ServiceBusTopicName	Name of the Service Bus Topic.Only applicable to Standard and Premium
EnablePartitioning	Boolean value to enable partitioning for Service Bus
serviceBusQueueName	Name of the Queue
QueueSize(MB)	Queue size
MessageTimeToLive	Message retention time
LockDuration	Resource lock duration
EnableSession	Boolean value to enable session

Template Script

```
{
  "$schema": "https://schema.management.azure.com/schemas/2015-01-
01/deploymentTemplate.json#",
  "contentVersion": "1.0.0.0",
  "parameters": {
    "serviceBusNamespaceName": {
      "type": "string",
      "metadata": {
        "description": "Name of the Service Bus Namespace"
      }
    },
    "skuTier": {
      "type": "string",
      "metadata": {
        "description": "Name of the Service Tier"
      },
      "allowedValues": [
        "Basic",
        "Standard",
        "Premium"
      ]
    },
    "serviceBusTopicName": {
      "type": "string",
      "metadata": {
        "description": "Name of the Service Bus Topic.Only applicable to Standard
and Premium"
      }
    },
    "EnablePartitioning": {
```

```
      "type": "bool"
    },
    "serviceBusQueueName": {
      "type": "string",
      "metadata": {
        "description": "Name of the Queue"
      }
    },
    "QueueSize(MB)": {
      "type": "string",
      "metadata": {
        "description": "Enter the Queue size"
      }
    },
    "MessageTimeToLive": {
      "type": "string",
      "allowedValues": [
        "PT5M",
        "PT10M"
      ]
    },
    "LockDuration": {
      "type": "string",
      "allowedValues": [
        "PT5M"
      ]
    },
    "EnableSession": {
      "type": "bool"
    }


  },
  "variables": {
    "sbVersion": "2015-08-01"
  },
  "resources": [
    {
      "apiVersion": "2017-04-01",
      "name": "[parameters('serviceBusNamespaceName')]",
      "type": "Microsoft.ServiceBus/namespaces",
      "location": "[resourceGroup().location]",
      "sku": {
        "name": "[parameters('skuTier')]",
        "tier": "[parameters('skuTier')]"
      },
      "properties": {},
      "resources": [
        {
          "apiVersion": "2017-04-01",
          "name": "[parameters('serviceBusTopicName')]",
          "type": "topics",
          "dependsOn": [
            "[concat('Microsoft.ServiceBus/namespaces/',
parameters('serviceBusNamespaceName'))]"
          ],
```

```
            "properties": {
              "path": "[parameters('serviceBusTopicName')]",
              "enablePartitioning": "[parameters('EnablePartitioning')]"
            },
            "resources": []
          },
          {
            "apiVersion": "2017-04-01",
            "name": "[parameters('serviceBusQueueName')]",
            "type": "Queues",
            "dependsOn": [
              "[concat('Microsoft.ServiceBus/namespaces/',
parameters('serviceBusNamespaceName'))]"
            ],
            "properties": {
              "maxSizeInMegabytes": "[parameters('QueueSize(MB)')]",
              "defaultMessageTimeToLive": "[parameters('MessageTimeToLive')]",
              "lockDuration": "[parameters('LockDuration')]",
              "requiresSession": "[parameters('EnableSession')]"
            }
          }
        ]

      }
    ]
}
```

5. Support Objectives

Below are the objectives to be fulfilled while providing support for instances of Azure Service Bus.

- Provisioning a Service Bus Namespace
- De-provisioning a Service Bus namespace
- Request for Onboarding of Azure Service Bus
    - Tag updates
    - Setting up monitoring metrics
- Request for Service Configuration
    - Request for Update Tags in Azure Service Bus
    - Request for monitoring resource usage in Azure Service Bus
    - Request to add, manage & delete queues
    - Request to add, manage & delete topics and subscriptions
    - Create a Relay namespace

6. Monitoring Metrics

This section details the metrics which are to be monitored for instances of Azure Service Bus.

6.1 Recommended Metrics

The following metrics are recommended to be enabled by default.

Metrics	Category	Threshold	Frequency in Mins/Hrs	Reason & Required remedial action
ServerErrors	Performance	5	5M	Server Errors for service bus namespace.
ActiveConnections	Performance	4	5M	Total Active Connections for Microsoft.ServiceBus.
Size	Information	2048	5M	Size of a Queue/Topic in Bytes.
ActiveMessages	Information	30	5M	Count of active messages in a Queue/Topic.
CPUXNS	Performance	80	5M	Service bus premium namespace CPU usage metric
WSXNS	Performance	80	5M	Service bus premium namespace memory usage metric

6.2 Optional Metrics

The following monitoring metrics are optional and can be enabled on a need basis.

Metrics	Category	Threshold	Frequency in Mins/Hrs	Reason & Required remedial action
UserErrors	Information	5	5M	User Errors for Microsoft.ServiceBus.
ThrottledRequests	Performance	10	5M	Throttled Requests for Microsoft.ServiceBus.
IncomingRequests	Information	30	5M	Incoming Requests for Microsoft.ServiceBus.
IncomingMessages	Performance	30	5M	Incoming Messages for Microsoft.ServiceBus.
OutgoingMessages	Performance	20	5M	Outgoing Messages for Microsoft.ServiceBus.
Messages	Information	50	5M	Count of messages in a Queue/Topic.

7. Monitoring Metrics Setup Script

This section provides a single script which can setup all the recommended metrics for monitoring.

```
{
  "$schema": "https://schema.management.azure.com/schemas/2015-01-01/deploymentTemplate.json#",
  "contentVersion": "1.0.0.0",
  "parameters": {
    "Alertname-ServerErrors": {
      "type": "string",
      "metadata": {
        "description": "Name of alert"
      }
    },
    "Alertname-ActiveConnections": {
```

```
    "type": "string",
    "metadata": {
      "description": "Name of alert"
    }
  },
  "Alertname-Size": {
    "type": "string",
    "metadata": {
      "description": "Name of alert"
    }
  },
  "Alertname-CPUXNS": {
    "type": "string",
    "metadata": {
      "description": "Name of alert"
    }
  },
  "Alertname-WSXNS": {
    "type": "string",
    "metadata": {
      "description": "Name of alert"
    }
  },
  "Alertname-ActiveMessages": {
    "type": "string",
    "metadata": {
      "description": "Name of alert"
    }
  },
  "Alertname-Description": {
    "type": "string",
    "defaultValue": "Alert will be triggerd when threshold value exceeded",
    "metadata": {
```

```
        "description": "Description of alert"
      }
    },
    "SubscriptionName": {
      "type": "string",
      "metadata": {
        "description": "Name of the subscription"
      }
    },
    "Alert-NofificationEnable": {
      "type": "Bool",
      "defaultValue": true,
      "metadata": {
        "description": "Specifies whether alerts are enabled"
      }
    },
    "Service Bus-ResourceID": {
      "type": "string",
      "metadata": {
        "description": "Resource ID of the resource emitting the metric that will
be used for the comparison."
      }
    },
    "SendEmailToBusinessOwners": {
      "type": "bool",
      "defaultValue": false,
      "metadata": {
        "description": "Specifies whether alerts are sent to service owners"
      }
    }
  },
  "resources": [
    {
```

```
      "type": "Microsoft.Insights/alertRules",
      "name": "[parameters('Alertname-ServerErrors')]",
      "location": "[resourceGroup().location]",
      "apiVersion": "2016-03-01",
      "properties": {
        "name": "[parameters('Alertname-ServerErrors')]",
        "description": "[parameters('Alertname-Description')]",
        "isEnabled": "[parameters('Alert-NofificationEnable')]",
        "condition": {
          "odata.type":
"Microsoft.Azure.Management.Insights.Models.ThresholdRuleCondition",
          "dataSource": {
            "odata.type":
"Microsoft.Azure.Management.Insights.Models.RuleMetricDataSource",
            "resourceUri": "[parameters('Service Bus-ResourceID')]",
            "metricName": "ServerErrors"
          },
          "operator": "GreaterThanOrEqual",
          "threshold": "5",
          "windowSize": "PT5M",
          "timeAggregation": "Total"
        },
        "actions": [
          {
            "odata.type":
"Microsoft.Azure.Management.Insights.Models.RuleEmailAction",
            "sendToServiceOwners": "[parameters('SendEmailToBusinessOwners')]"
          },
          {
            "odata.type":
"Microsoft.Azure.Management.Insights.Models.RuleWebhookAction",
            "serviceUri": "https://replacewithmonitoringsolutionwebhookurl",
            "properties": {

              "severity": "Error",
```

```
              "subscriptionname": "[parameters('SubscriptionName')]"
            }
          }
        ]
      }
    },
    {
      "type": "Microsoft.Insights/alertRules",
      "name": "[parameters('Alertname-ActiveConnections')]",
      "location": "[resourceGroup().location]",
      "apiVersion": "2016-03-01",
      "properties": {
        "name": "[parameters('Alertname-ActiveConnections')]",
        "description": "[parameters('Alertname-Description')]",
        "isEnabled": "[parameters('Alert-NofificationEnable')]",
        "condition": {
          "odata.type":
"Microsoft.Azure.Management.Insights.Models.ThresholdRuleCondition",
          "dataSource": {
            "odata.type":
"Microsoft.Azure.Management.Insights.Models.RuleMetricDataSource",
            "resourceUri": "[parameters('Service Bus-ResourceID')]",
            "metricName": "ActiveConnections"
          },
          "operator": "GreaterThan",
          "threshold": "4",
          "windowSize": "PT15M",
          "timeAggregation": "Total"
        },
        "actions": [
          {
            "odata.type":
"Microsoft.Azure.Management.Insights.Models.RuleEmailAction",
            "sendToServiceOwners": "[parameters('SendEmailToBusinessOwners')]"
```

```
          },
          {
            "odata.type":
"Microsoft.Azure.Management.Insights.Models.RuleWebhookAction",
            "serviceUri": "https://replacewithmonitoringsolutionwebhookurl",
            "properties": {

              "severity": "Info",
              "subscriptionname": "[parameters('SubscriptionName')]"
            }
          }
        ]
      }
    },
    {
      "type": "Microsoft.Insights/alertRules",
      "name": "[parameters('Alertname-Size')]",
      "location": "[resourceGroup().location]",
      "apiVersion": "2016-03-01",
      "properties": {
        "name": "[parameters('Alertname-Size')]",
        "description": "[parameters('Alertname-Description')]",
        "isEnabled": "[parameters('Alert-NofificationEnable')]",
        "condition": {
          "odata.type":
"Microsoft.Azure.Management.Insights.Models.ThresholdRuleCondition",
          "dataSource": {
            "odata.type":
"Microsoft.Azure.Management.Insights.Models.RuleMetricDataSource",
            "resourceUri": "[parameters('Service Bus-ResourceID')]",
            "metricName": "Size"
          },
          "operator": "GreaterThanOrEqual",
          "threshold": "2048",
```

```
          "windowSize": "PT15M",
          "timeAggregation": "Average"
        },
        "actions": [
          {
            "odata.type":
"Microsoft.Azure.Management.Insights.Models.RuleEmailAction",
            "sendToServiceOwners": "[parameters('SendEmailToBusinessOwners')]"
          },
          {
            "odata.type":
"Microsoft.Azure.Management.Insights.Models.RuleWebhookAction",
            "serviceUri": "https://replacewithmonitoringsolutionwebhookurl",
            "properties": {

              "severity": "Info",
              "subscriptionname": "[parameters('SubscriptionName')]"
            }
          }
        ]
      }
    },
    {
      "type": "Microsoft.Insights/alertRules",
      "name": "[parameters('Alertname-CPUXNS')]",
      "location": "[resourceGroup().location]",
      "apiVersion": "2016-03-01",
      "properties": {
        "name": "[parameters('Alertname-CPUXNS')]",
        "description": "[parameters('Alertname-Description')]",
        "isEnabled": "[parameters('Alert-NofificationEnable')]",
        "condition": {
          "odata.type":
"Microsoft.Azure.Management.Insights.Models.ThresholdRuleCondition",
```

```
          "dataSource": {
            "odata.type":
"Microsoft.Azure.Management.Insights.Models.RuleMetricDataSource",
            "resourceUri": "[parameters('Service Bus-ResourceID')]",
            "metricName": "CPUXNS"
          },
          "operator": "GreaterThanOrEqual",
          "threshold": "80",
          "windowSize": "PT15M",
          "timeAggregation": "Maximum"
        },
        "actions": [
          {
            "odata.type":
"Microsoft.Azure.Management.Insights.Models.RuleEmailAction",
            "sendToServiceOwners": "[parameters('SendEmailToBusinessOwners')]"
          },
          {
            "odata.type":
"Microsoft.Azure.Management.Insights.Models.RuleWebhookAction",
            "serviceUri": "https://replacewithmonitoringsolutionwebhookurl",
            "properties": {

              "severity": "Warning",
              "subscriptionname": "[parameters('SubscriptionName')]"
            }
          }
        ]
      }
    },
    {
      "type": "Microsoft.Insights/alertRules",
      "name": "[parameters('Alertname-WSXNS')]",
      "location": "[resourceGroup().location]",
```

```
      "apiVersion": "2016-03-01",
      "properties": {
        "name": "[parameters('Alertname-WSXNS')]",
        "description": "[parameters('Alertname-Description')]",
        "isEnabled": "[parameters('Alert-NofificationEnable')]",
        "condition": {
          "odata.type":
"Microsoft.Azure.Management.Insights.Models.ThresholdRuleCondition",
          "dataSource": {
            "odata.type":
"Microsoft.Azure.Management.Insights.Models.RuleMetricDataSource",
            "resourceUri": "[parameters('Service Bus-ResourceID')]",
            "metricName": "WSXNS"
          },
          "operator": "GreaterThanOrEqual",
          "threshold": "80",
          "windowSize": "PT15M",
          "timeAggregation": "Maximum"
        },
        "actions": [
          {
            "odata.type":
"Microsoft.Azure.Management.Insights.Models.RuleEmailAction",
            "sendToServiceOwners": "[parameters('SendEmailToBusinessOwners')]"
          },
          {
            "odata.type":
"Microsoft.Azure.Management.Insights.Models.RuleWebhookAction",
            "serviceUri": "https://replacewithmonitoringsolutionwebhookurl",
            "properties": {

              "severity": "Warning",
              "subscriptionname": "[parameters('SubscriptionName')]"
            }
          }
```

```
        ]
      }
    },
    {
      "type": "Microsoft.Insights/alertRules",
      "name": "[parameters('Alertname-ActiveMessages')]",
      "location": "[resourceGroup().location]",
      "apiVersion": "2016-03-01",
      "properties": {
        "name": "[parameters('Alertname-ActiveMessages')]",
        "description": "[parameters('Alertname-Description')]",
        "isEnabled": "[parameters('Alert-NofificationEnable')]",
        "condition": {
          "odata.type":
"Microsoft.Azure.Management.Insights.Models.ThresholdRuleCondition",
          "dataSource": {
            "odata.type":
"Microsoft.Azure.Management.Insights.Models.RuleMetricDataSource",
            "resourceUri": "[parameters('Service Bus-ResourceID')]",
            "metricName": "ActiveMessages"
          },
          "operator": "GreaterThanOrEqual",
          "threshold": "30",
          "windowSize": "PT15M",
          "timeAggregation": "Average"
        },
        "actions": [
          {
            "odata.type":
"Microsoft.Azure.Management.Insights.Models.RuleEmailAction",
            "sendToServiceOwners": "[parameters('SendEmailToBusinessOwners')]"
          },
          {
            "odata.type":
"Microsoft.Azure.Management.Insights.Models.RuleWebhookAction",
```

```
            "serviceUri": "https://replacewithmonitoringsolutionwebhookurl",
            "properties": {

              "severity": "Info",
              "subscriptionname": "[parameters('SubscriptionName')]"
            }
          }
        ]
      }
    }
  ]
}
```