Cognizant CLOUD SERVICES

Blueprint – Azure Redis Cache

Revision History

Date	Version	Author	Reviewer(s)	Comments
6-Aug-2018	1.0	Ankit	Tressa	Initial Draft

Contents

1. Scope 4
2. Overview 4
3. Service Usage 4
   - 3.1 Best Practices 4
   - 3.2 Microsoft SLA 4
   - 3.3 Service Connectivity 4
   - 3.4 Recommended tiers for enterprise usage 4
   - 3.5 Technical Limitations 5
   - 3.6 Additional Notes 5
   - 3.7 Service Usage Diagram 5
4. Provisioning Script 5
5. Support Objectives 7
6. Monitoring Metrics 8
   - 6.1 Recommended Metrics 8
   - 6.2 Optional Metrics 8
7. Monitoring Metrics Setup Script 9

1. Scope

This document provides the blueprint for the Redis Cache 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

Redis is an open source (BSD licensed), in-memory data structure store, used as a database, cache and message broker. It supports data structures such as strings, hashes, lists, and sets, sorted sets with range queries, bitmaps and geospatial indexes with radius queries. Redis has built-in replication, LUA scripting, LRU eviction, transactions and different levels of on-disk persistence, and provides high availability via Redis Sentinel and automatic partitioning with Redis Cluster.

For more details: https://docs.microsoft.com/en-us/azure/redis-cache/cache-overview

3. Service Usage

3.1 Best Practices

- Recommended to store fault tolerant data
- Use clustering to increase performance. https://docs.microsoft.com/en-us/azure/redis-cache/cache-how-to-premium-clustering

3.2 Microsoft SLA

99.9% for both Standard & Premium

3.3 Service Connectivity

- Firewall rules available in all tiers
- VNET service endpoints available in premium tier

3.4 Recommended tiers for enterprise usage

- Standard: For non-prod environments
- Premium: For prod environments

3.5 Technical Limitations

Redis Cache Console won't be accessible in case VNET / firewall rules are configured on a Redis cache instance

3.6 Additional Notes

- Data persistence and Geo-replication (currently in preview) features are available in Premium tier only
- When firewall rules are saved, there will be a short delay before the rule is effective
- Connections from Redis Cache monitoring systems are always permitted even if firewall rules are in place
- In the event of failure, there is no automatic failover. https://docs.microsoft.com/en-us/azure/redis-cache/cache-how-to-geo-replication#how-does-failing-over-to-the-secondary-linked-cache-work.

3.7 Service Usage Diagram

To be added

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
RedisCacheName	The name of the Azure Redis Cache to create.
RedisCacheSKU	The pricing tier of the new Azure Redis Cache
RedisCacheFamily	The family for the sku
RedisCacheCapacity	The size of the new Azure Redis Cache instance.
Tag Values	Service Tags for the resource to categories

Template Script

```
{
  "$schema": "http://schema.management.azure.com/schemas/2015-01-
01/deploymentTemplate.json",
  "contentVersion": "1.0.0.0",
  "parameters": {
    "RedisCacheName": {
      "type": "string",
      "metadata": {
        "description": "The name of the Azure Redis Cache to create."
      }
    },
    "RedisCacheSKU": {
      "type": "string",
      "allowedValues": [
        "Basic",
        "Standard",
        "Premium"
      ],
      "defaultValue": "Standard",
      "metadata": {
        "description": "The pricing tier of the new Azure Redis Cache."
      }
    },
    "RedisCacheFamily": {
      "type": "string",
      "defaultValue": "C",
      "metadata": {
        "description": "The family for the sku."
      },
      "allowedValues": [
        "C",
        "P"
      ]
    },
    "RedisCacheCapacity": {
      "type": "int",
      "allowedValues": [
        0,
        1,
        2,
        3,
        4,
        5,
        6
      ],
      "defaultValue": 1,
      "metadata": {
        "description": "The size of the new Azure Redis Cache instance. "
      }
    },

    "StorageTagValues": {
      "type": "object",
      "defaultValue": {
```

```
        "Tag1Name": "Tag1Value",
        "Tag2Name":  "Tag2Value"
      }
    }
  },
  "resources": [
    {
      "apiVersion": "2015-08-01",
      "name": "[parameters('RedisCacheName')]",
      "type": "Microsoft.Cache/Redis",
      "tags": "[parameters('StorageTagValues')]",
      "location": "[resourceGroup().location]",
      "properties": {
        "enableNonSslPort": false,
        "sku": {
          "capacity": "[parameters('RedisCacheCapacity')]",
          "family": "[parameters('RedisCacheFamily')]",
          "name": "[parameters('RedisCacheSKU')]"
        }
      }
    }
  ]
}
```

5. Support Objectives

Below are the objectives to be fulfilled while providing support for instances of Redis Cache.

1. Provisioning of Azure Redis Cache
2. De-Provision of Azure Redis Cache
3. Onboarding of Azure Redis Cache
4. Scaling of Redis cache
5. Regenerate the Redis cache keys(on-demand)
6. Regenerate the Redis cache keys(on-schedule)
7. Updating Tags of Redis cache

6. Monitoring Metrics

This section details the metrics which are to be monitored for instances of Redis Cache.

6.1 Recommended Metrics

The following metrics are recommended to be enabled by default:

Metrics	Category	Operator Type	Threshold	Unit	Frequency in Mins/Hrs
Connected Clients	Information	>	Prod: 90% of max connections Dev: 70% of max connections	Count	1H
Used Memory	Performance	<	Prod: 90% of total available memory Dev: 70% of total available memory	Bytes	1H
Server Load	Performance	>	75%	Percent	5M
Connected Clients (shard 0-9)	Information	>	Prod: 90% of max connections Dev: 70% of max connections	Count	1H
Server Load (shard 0-9)	Performance	>	75%	Percent	5M
Used Memory (shard 0-9)	Performance	<	Prod: 90% of total available memory Dev: 70% of total available memory	Bytes	1H

6.2 Optional Metrics

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

Metrics	Category	Operator Type	Threshold	Unit	Frequency in Mins/Hrs
Cache Misses	Information	>	40	count	1H
CPU	Performance	>	75%	Percent	15M
Cache Misses (Shard 0-9)	Information	>	40	count	1H
CPU (Shard 0-9)	Performance	>	75%	Percent	15M

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-Connected Clients": {
      "type": "string",
      "metadata": {
        "description": "Name of alert"
      }
    },
    "Alertname-Used Memory": {
      "type": "string",
      "metadata": {
        "description": "Name of alert"
      }
    },
    "Alertname-Server Load": {
      "type": "string",
```

```
    "metadata": {
      "description": "Name of alert"
    }
  },
  "Alertname-Connected Clients(shard 0-9)": {
    "type": "string",
    "metadata": {
      "description": "Name of alert"
    }
  },
  "Alertname-Used Memory(shard 0-9)": {
    "type": "string",
    "metadata": {
      "description": "Name of alert"
    }
  },
  "Alertname-Server Load(shard 0-9)": {
    "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"
      }
    },
    "RedisCache-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-Connected Clients')]",
      "location": "[resourceGroup().location]",
      "apiVersion": "2016-03-01",
      "properties": {
        "name": "[parameters('Alertname-Connected Clients')]",
        "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('RedisCache-ResourceID')]",
            "metricName": "connectedclients"
          },
          "operator": "GreaterThan",
          "threshold": "6750",
          "windowSize": "PT5M",
          "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": "Error",
              "subscriptionname": "[parameters('SubscriptionName')]"
            }
          }
        ]
      }
    },
    {
```

```
      "type": "Microsoft.Insights/alertRules",
      "name": "[parameters('Alertname-Used Memory')]",
      "location": "[resourceGroup().location]",
      "apiVersion": "2016-03-01",
      "properties": {
        "name": "[parameters('Alertname-Used Memory')]",
        "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('RedisCache-ResourceID')]",
            "metricName": "usedmemory"
          },
          "operator": "LessThan",
          "threshold": "8E+06",
          "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": "Info",
```

```
              "subscriptionname": "[parameters('SubscriptionName')]"
            }
          }
        ]
      }
    },
    {
      "type": "Microsoft.Insights/alertRules",
      "name": "[parameters('Alertname-Server Load')]",
      "location": "[resourceGroup().location]",
      "apiVersion": "2016-03-01",
      "properties": {
        "name": "[parameters('Alertname-Server Load')]",
        "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('RedisCache-ResourceID')]",
            "metricName": "serverLoad"
          },
          "operator": "GreaterThan",
          "threshold": "75",
          "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": "Info",
              "subscriptionname": "[parameters('SubscriptionName')]"
            }
          }
        ]
      }
    },
    {
      "type": "Microsoft.Insights/alertRules",
      "name": "[parameters('Alertname-Connected Clients(shard 0-9)')]",
      "location": "[resourceGroup().location]",
      "apiVersion": "2016-03-01",
      "properties": {
        "name": "[parameters('Alertname-Connected Clients(shard 0-9)')]",
        "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('RedisCache-ResourceID')]",
            "metricName": "connectedclients9"
          },
          "operator": "GreaterThan",
          "threshold": "6750",
```

```
          "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-Used Memory(shard 0-9)')]",
      "location": "[resourceGroup().location]",
      "apiVersion": "2016-03-01",
      "properties": {
        "name": "[parameters('Alertname-Used Memory(shard 0-9)')]",
        "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('RedisCache-ResourceID')]",
            "metricName": "usedmemory9"
          },
          "operator": "LessThan",
          "threshold": "8E+06",
          "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-Server Load(shard 0-9)')]",
      "location": "[resourceGroup().location]",
```

```
      "apiVersion": "2016-03-01",
      "properties": {
        "name": "[parameters('Alertname-Server Load(shard 0-9)')]",
        "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('RedisCache-ResourceID')]",
            "metricName": "serverLoad9"
          },
          "operator": "GreaterThan",
          "threshold": "0.75",
          "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": "Info",
              "subscriptionname": "[parameters('SubscriptionName')]"
            }
          }
```

```
            ]
          }
        }
      ]
    }
```