

# Controller Design Studio Initiative

## Background

- 1 [Background](#)
- 2 [Introduction](#)
- 3 [Architecture](#)
- 4 [Detailed Architecture](#)  
PowerPoint Package:  
[Controller Design Studio.pptx](#)
- 5 [Proposed Work Items](#)
  - 6.1 [Design Time](#)
  - 6.2 [Run Time](#)
- 7 [Artifact](#)
  - 7.1 [Instantiation](#)
- 8 [Controller Design Studio Functionality Demo:](#)

- For the ONAP Beijing release, the APPC project delivered the CDT design tool to support the APPC model driven design approach.
- For the next ONAP releases Casablanca, we are proposing to develop a common design tool to support both SDNC and Generic L4-7 NFs (APPC, VFC) Controller integrated with SDC.
- This common design tool, also called “**Controller Design Studio**”, will be built with associated data dictionary and an Ingredient Resource Resolution Microservice
- The common design tool models shall be backwards compatible to the current use cases supported in Amsterdam and Beijing release by Generic L4-7 NF (APP-C specific).

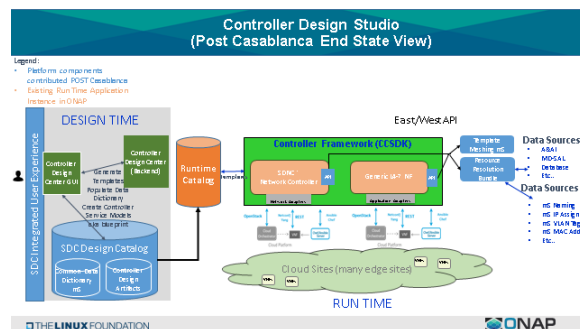
## Introduction

The system is designed to be self service, which means that users, not just programmers, can reconfigure the software system as needed to meet customer requirements. To accomplish this goal, the system is built around models that provide for real-time changes in how the system operates. Users merely need to change a model to change how a service operates.

Self service is a completely new way of delivering services. It removes the dependence on code releases and the delays they cause and puts the control of services into the hands of the service providers. They can change a model and its parameters and create a new service without writing a single line of code. This makes SERVICE PROVIDER(S) more responsive to its customers and able to deliver products that more closely match the needs of its customers.

## Architecture

The Controller Design Studio is composed of two major components: the GUI (or frontend) and the Run Time (or backend). The GUI handles direct user input and allows for displaying both design time and run time activities. For design time, it allows for the creation of controller blueprint, from selecting the DGs to be included, to incorporating the artifact templates, to adding necessary components. For run time, it allows the user to direct the system to resolve the unresolved elements of the controller blueprint and download the resulting configuration into a VNF. At a more basic level, it allows for creation of data dictionaries, capabilities catalogs, and controller blueprint, the basic elements that are used to generate a configuration. The essential function of the Controller Design Studio is to create and populate a controller blueprint, create a configuration file from this Controller blueprint, and download this configuration file (configlet) to a VNF/PNF.



## Detailed Architecture PowerPoint Package:

[Controller Design Studio.pptx](#)

## Proposed Work Items

## Design Time

| Feature                      |   | Description   | JIRA  | Owner  | Wiki Page | Notes   |
|------------------------------|---|---|---|--|-----------|---|
| Controller Design Studio GUI | 1 | Refactor and move the APP-C CDT to CCSDK for "Controller Design Studio" mS.   | <a href="#">CCSDK-334 - Getting issue details...</a><br><input type="button" value="STATUS"/> | AT&T   |           | All Controller Design Studio will be maintained in the APP-C repo[appc/cdt] for Casablanca Release.<br><br><b>JIRA can be canceled.</b>   |
|                              | 2 | CDS Controller Blueprint Creation and Management including artifact model, component model, connectivity model, and dg modeling in "Controller Design Studio" mS. | <a href="#">APPC-1129 - Getting issue details...</a><br><input type="button" value="STATUS"/> | AT&T   |           | [appc/cdt] - Srikanth V<br><br><a href="#">APPC-1133 - Getting issue details...</a><br><input type="button" value="STATUS"/><br><br><a href="#">APPC-1152 - Getting issue details...</a><br><input type="button" value="STATUS"/><br><br><a href="#">APPC-1153 - Getting issue details...</a><br><input type="button" value="STATUS"/><br><br><a href="#">APPC-1154 - Getting issue details...</a><br><input type="button" value="STATUS"/><br><br><a href="#">APPC-1155 - Getting issue details...</a><br><input type="button" value="STATUS"/><br><br><a href="#">APPC-1156 - Getting issue details...</a><br><input type="button" value="STATUS"/><br><br><a href="#">APPC-1177 - Getting issue details...</a><br><input type="button" value="STATUS"/><br><br><a href="#">APPC-1179 - Getting issue details...</a><br><input type="button" value="STATUS"/> |
|                              | 3 | CDS Catalog Creation and Management in "Controller Design Studio" mS.   |   |  |           |   |
|                              | 4 | CDS Data Dictionary Creation and Management in "Controller Design Studio" mS.   |   |  |           |   |
|                              | 5 | CDT enhance existing screen to support data dictionary panel layout and data dictionary reference model creation for existing APP-C Models.                       | <a href="#">APPC-1131 - Getting issue details...</a><br><input type="button" value="STATUS"/> | AT&T<br>Tech M<br>IBM<br>Bell Canada<br>Erickson |           | [appc/cdt]<br><br><b>In Progress</b><br><br><b>Girish - Tech M</b>  |

|   |   |   |                                      |   |
|---|---|---|--------------------------------------|---|
| 6 | Controller Design Time Studio app extension with SDC integration. | <p><a href="#">CCSDK-338</a> - Getting issue details...</p> <p>STATUS</p>   | AT&T<br>Tech M<br>IBM<br>Bell Canada | Deferred to the next ONAP release   |
| 7 | CDS Backend mS Support  | <p><a href="#">CCSDK-458</a> - Getting issue details...</p> <p>STATUS</p> <p><a href="#">CCSDK-410</a> - Getting issue details...</p> <p>STATUS</p> <p><a href="#">CCSDK-415</a> - Getting issue details...</p> <p>STATUS</p> <p><a href="#">CCSDK-416</a> - Getting issue details...</p> <p>STATUS</p> | AT&T                                 | <p>ccsdk/apps</p> <p>Brinda</p> <p><a href="#">CCSDK-467</a> - Getting issue details...</p> <p>STATUS</p> <p><a href="#">CCSDK-468</a> - Getting issue details...</p> <p>STATUS</p> <p><a href="#">CCSDK-469</a> - Getting issue details...</p> <p>STATUS</p> <p><a href="#">CCSDK-483</a> - Getting issue details...</p> <p>STATUS</p> <p><a href="#">CCSDK-487</a> - Getting issue details...</p> <p>STATUS</p> <p><a href="#">CCSDK-488</a> - Getting issue details...</p> <p>STATUS</p> <p><a href="#">CCSDK-491</a> - Getting issue details...</p> <p>STATUS</p> <p><a href="#">CCSDK-429</a> - Getting issue details...</p> <p>STATUS</p> <p><a href="#">CCSDK-431</a> - Getting issue details...</p> <p>STATUS</p> <p><a href="#">CCSDK-432</a> - Getting issue details...</p> <p>STATUS</p> <p><a href="#">CCSDK-484</a> - Getting issue details...</p> <p>STATUS</p> |

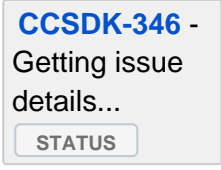
|  |   |   |  |      |  |   |
|--|---|---|--|------|--|---|
|  | 8 | Policy Manager Naming Policy support for vFW Use case |  | AT&T |  | Support the vFW naming policy model and policy instance as part of PM deployment<br><br><div style="border: 1px solid #ccc; padding: 5px; width: fit-content;"> <a href="#">POLICY-983 - Getting issue details...</a><br/> <span style="border: 1px solid #ccc; padding: 2px 5px;">STATUS</span> </div> |
|--|---|---|--|------|--|---|

## Run Time

| Feature       |   | Description  | JIRA   | Contributors | Wiki Page | NOTES   |
|---------------|---|--|--|--------------|-----------|---|
| Instantiation | 1 | Generic Resource API integration with netbox ip management capability for assign   | <div style="border: 1px solid #ccc; padding: 5px; width: fit-content;"> <a href="#">CCSDK-339 - Getting issue details...</a><br/> <span style="border: 1px solid #ccc; padding: 2px 5px;">STATUS</span> </div> | Bell Canada  |           | <p><b>Alexis/Marc - Implementation Complete for all the Self Service sub dg and integration with netbox capability. Target Completion Date (9/07) - Delivered</b></p> <p>Ajay/Pat - Push the latest Sub DG to ONAP and Refactor naming Gen Sub D to call the naming mS Rest API directly.</p> <div style="border: 1px solid #ccc; padding: 5px; width: fit-content;"> <a href="#">CCSDK-481 - Getting issue details...</a><br/> <span style="border: 1px solid #ccc; padding: 2px 5px;">STATUS</span> </div> <div style="border: 1px solid #ccc; padding: 5px; width: fit-content;"> <a href="#">CCSDK-482 - Getting issue details...</a><br/> <span style="border: 1px solid #ccc; padding: 2px 5px;">STATUS</span> </div> |
|               | 2 | Generic Resource API integration with netbox ip management capability for unassign | <div style="border: 1px solid #ccc; padding: 5px; width: fit-content;"> <a href="#">CCSDK-340 - Getting issue details...</a><br/> <span style="border: 1px solid #ccc; padding: 2px 5px;">STATUS</span> </div> | Bell Canada  |           | <p><b>Alexis/Marc - Implementation Completed for all the Self Service sub dg and integration with netbox capability. Target Completion Date (9/07) - Delivered</b></p>  |

|   |  |  |             |  |
|---|--|--|-------------|--|
| 3 | netbox ip management REST API support in ONAP        | <p><b>CCSDK-341</b> - Getting issue details...</p> <p>STATUS</p>   | Bell Canada | <p><b>Alexis/Marc</b> - Implementati<br/>Completed for all the Netbox Client with Helm chart , pre-provisioning script and DB Creation.</p> <p>Create a helm chart for us case:</p> <p><b>CCSDK-366</b> - Getting issue details...</p> <p>STATUS</p> <p>pre-provisioning scripts (Targeted for 8/17):</p> <p><b>CCSDK-460</b> - Getting issue details...</p> <p>STATUS</p> <p>Netbox Client – (Reserve th IP) - Target for 8/17</p> <p><b>CCSDK-462</b> - Getting issue details...</p> <p>STATUS</p> <p>IPAM DB Creation: Target for 8/17</p> <p><b>CCSDK-463</b> - Getting issue details...</p> <p>STATUS</p> |
| 4 | Policy driven naming mS in ONAP                      | <p><b>CCSDK-342</b> - Getting issue details...</p> <p>STATUS</p>   | AT&T        | <p>[ccsdk/apps]</p> <p>Biju T: 7/20 for draft code submission and including dr template. (Preference with policy to boot with the artifac</p> <p>8/17 – Submitted the Code</p>   |
| 5 | Resource Resolution using data dictionary mS in ONAP | <p><b>CCSDK-411</b> - Getting issue details...</p> <p>STATUS</p> <p><b>CCSDK-412</b> - Getting issue details...</p> <p>STATUS</p> <p><b>CCSDK-412</b> - Getting issue details...</p> <p>STATUS</p> | AT&T        | <p>[ccsdk/apps] - Dan T contributed the fist batch of code in draft version.</p> <p>Kapil S/Brinda S</p> <p>In Progress</p> <p><b>CCSDK-490</b> - Getting issue details...</p> <p>STATUS</p>   |

|                    |   |  |   |  |
|--------------------|---|--|---|--|
|                    | 6 | Template meshing mS in ONAP<br><br><div data-bbox="836 178 1055 346" style="border: 1px solid gray; padding: 5px;"> <p><b>CCSDK-344</b> - Getting issue details...</p> <p>STATUS</p> </div>  | AT&T  | [ccsdk/apps] - Dan T contributed the first batch of code in draft version.<br><br>Kapil S/Brinda S<br><br>In Progress<br><br><ul style="list-style-type: none"> <li>• Design Time (Draft Code Submitted and API testing in progress.)</li> <li>• Runtime (requires discussion)</li> </ul>  |
|                    | 7 | Controller Design Time Studio app extension with SDC integration ingest and store the artifact in the controller persona (SDN-C)<br><br><div data-bbox="836 630 1055 798" style="border: 1px solid gray; padding: 5px;"> <p><b>CCSDK-345</b> - Getting issue details...</p> <p>STATUS</p> </div>   | AT&T<br><br>Tech M<br><br>IBM<br><br>Bell Canada                        | <b>Deferred to the next ONAF release</b>   |
|                    | 8 | Controller Design Time Studio app extension with SDC integration ingest and store the artifact in the controller persona (APP-C)<br><br><div data-bbox="836 1008 1055 1102" style="border: 1px solid gray; padding: 5px;"> <p><b>CCSDK-349</b> - Getting issue details...</p> <p>STATUS</p> </div> | AT&T<br><br>Tech M<br><br>IBM<br><br>Bell Canada                        | <b>Deferred to the next ONAF release</b>   |
|                    | 9 | Heat and SDC Tosca Update for VFW to include SDNC Controller Blueprint Model Information.<br><br><div data-bbox="836 1249 1055 1354" style="border: 1px solid gray; padding: 5px;"> <p><b>CCSDK-380</b> - Getting issue details...</p> <p>STATUS</p> </div>  | Bell Canada   | <div data-bbox="1299 1260 1502 1354" style="border: 1px solid gray; padding: 5px;"> <p><b>CCSDK-493</b> - Getting issue details...</p> <p>STATUS</p> </div>  |
| Post Instantiation | 1 | APP-C Integration with resource resolution REST API based on data dictionary.<br><br><div data-bbox="836 1407 1055 1501" style="border: 1px solid gray; padding: 5px;"> <p><b>APPC-1077</b> - Getting issue details...</p> <p>STATUS</p> </div>  | AT&T<br><br>Tech M<br><br><b>IBM</b><br><br>Bell Canada<br><br>Erickson | scale out use case. (include the discussion with Scott)<br><br><b>Krill</b><br><br>Swagger API for calling the RA API for data and artifact collection. <b>Brinda/Kapil to provide this information.</b><br><br><b>Taka is the PTL for APP-C. Need to review the design with Taka before code contribution.</b><br><br><b>In Progress.</b> |

|   |   |  |      |  |  |
|---|---|--|------|--|--|
| 2 | CDS<br>Contribution for<br>Configuration<br>Generation,<br>Preview and<br>Deployment. |  | AT&T |  | Kapil S/Brinda S<br><br>Deferred to Dublin Release |
|   |   |  |      |  |  |
|   |   |  |      |  |  |
|   |   |  |      |  |  |
|   |   |  |      |  |  |

## Artifact

### Instantiation

```

{
  "resource-accumulator-resolved-data": [
    {
      "param-name": "service-instance-id",
      "param-value": "${service-instance-id}"
    },
    {
      "param-name": "vnf_id",
      "param-value": "${vnf-id}"
    },
    {
      "param-name": "vnf_name",
      "param-value": "${vnf-name}"
    },
    {
      "param-name": "vnf_model_customization_uuid",
      "param-value": "${vnf-model-customization-uuid}"
    },
    {
      "param-name": "vf_module_id",
      "param-value": "${vf-module-id}"
    }
  ]
}

```

```
{
  "param-name": "vf_module_customization_uuid",
  "param-value": "${vf-module-model-customization-uuid}"
},
{
  "param-name": "aic-cloud-region",
  "param-value": "${aic-cloud-region}"
},
{
  "param-name": "aic_cli",
  "param-value": "${aic_cli}"
},
{
  "param-name": "avaibility_zone_0",
  "param-value": "${avaibility_zone_0}"
},
{
  "param-name": "cloud_env",
  "param-value": "openstack"
},
{
  "param-name": "repo_url_artifacts",
  "param-value": "
https://nexus.onap.org/content/groups/staging
"
},
{
  "param-name": "repo_url_blob",
  "param-value": "
https://nexus.onap.org/content/repositories/raw
"
},
{
  "param-name": "dcae_collector_port",
  "param-value": "8080"
},
{
  "param-name": "image_name",
  "param-value": "Ubuntu 14.04 LTS Generic"
},
{
  "param-name": "flavor_name",
```



```

    "param-value": "m1.medium"
  },
  {
    "param-name": "install_script_version",
    "param-value": "1.2.1-SNAPSHOT"
  },
  {
    "param-name": "demo_artifacts_version",
    "param-value": "1.2.1-SNAPSHOT"
  },
  {
    "param-name": "dcae_collector_ip",
    "param-value": "10.0.4.1"
  },
  {
    "param-name": "pub_key",
    "param-value": "ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQKDggo3+WOqcUG8
/5uUbk81+yczgwC4Y8ywTmuQqbNxlY1oQ0YxdMUqUnhitSXs5S
/yRuAVOYHwGg2mCs20oAlNrP+mxBI544AMlb9itPjCtgqtE2EWo6MmnFGbHB4Sx3XioE7F4VPsh7j
apslwzOjbrQe+Mua1TGQ5d4nfEQaaglXLLPFfuc7WbhbJbK6Q7rHqZfRcOwAMXgDoBqlyqKeiKwn
umddo2RyNT8jYmvB6buz7KnMinzo7qB0uktVT05FH9Rg0CTWH5norlG5qXgP2aukL0gk1ph8iAt7uY
Lf1ktp+LJI2gaF6L0/qii9EmVCSLr1uJ38Q8CBflhkh"
  }
],
"capability-data": [
  {
    "capability-name": "generate-name",
    "key-mapping": [
      {
        "payload": [
          {
            "param-name": "resource-name",
            "param-value": "vsn_name_0"
          },
          {
            "param-name": "external-key",
            "param-value": "${vf-module-id}_vsn_name_0"
          }
        ],
        "param-name": "policy-instance-name",
        "param-value": "${vsn-naming-policy}"
      }
    ]
  }
]

```

```
"param-name": "nf-role",
"param-value": "${nf-role}"
},
{
"param-name": "naming-type",
"param-value": "VM"
},
{
"param-name": "VNF_NAME",
"param-value": "${vnf-name}"
},
{
"param-name": "NFC_NAMING_CODE",
"param-value": "${nfc-naming-code}"
}
],
"output-key-mapping": [
{
"resource-name": "vsn_name_0",
"resource-value": "${vsn_name_0}"
}
]
},
{
"payload": [
{
"param-name": "resource-name",
"param-value": "vfw_name_0"
},
{
"param-name": "external-key",
"param-value": "${vf-module-id}_vfw_name_0"
},
{
"param-name": "policy-instance-name",
"param-value": "${vfw-naming-policy}"
},
{
"param-name": "nf-role",
"param-value": "${nf-role}"
}
```

```
},
{
  "param-name": "naming-type",
  "param-value": "VM"
},
{
  "param-name": "VNF_NAME",
  "param-value": "${vnf-name}"
},
{
  "param-name": "NFC_NAMING_CODE",
  "param-value": "${nfc-naming-code}"
}
],
"output-key-mapping": [
  {
    "resource-name": "vsn_name_0",
    "resource-value": "${vfw_name_0}"
  }
]
},
{
  "payload": [
    {
      "param-name": "resource-name",
      "param-value": "vf-module-name"
    },
    {
      "param-name": "external-key",
      "param-value": "${vf-module-id}"
    },
    {
      "param-name": "policy-instance-name",
      "param-value": "${vf-naming-policy}"
    },
    {
      "param-name": "nf-role",
      "param-value": "${nf-role}"
    }
  ]
}
```

```
"param-name": "naming-type",
"param-value": "VF-MODULE"
},
{
"param-name": "VNF_NAME",
"param-value": "${vnf-name}"
},
{
"param-name": "VF_MODULE_LABEL",
"param-value": "${vf-module-label}"
},
{
"param-name": "VF_MODULE_TYPE",
"param-value": "${vf-module-type}"
}
],
"output-key-mapping": [
{
"resource-name": "vf_module_name",
"resource-value": "${vf-module-name}"
}
]
},
{
"payload": [
{
"param-name": "resource-name",
"param-value": "volume-name"
},
{
"param-name": "policy-instance-name",
"param-value": "${vf-naming-policy}"
},
{
"param-name": "nf-role",
"param-value": "${nf-role}"
},
{
"param-name": "naming-type",
"param-value": "VOLUME"
}
```

```
    },
    {
      "param-name": "VOLUME_GROUP_NAME",
      "param-value": "${volume-group-name}"
    }
  ],
  "output-key-mapping": [
    {
      "resource-name": "vmxvre_volume_name_1",
      "resource-value": "${volume-name}"
    },
    {
      "resource-name": "vmxvre_volume_name_0",
      "resource-value": "${volume-name}"
    }
  ]
}
]
},
{
  "capability-name": "netbox-ip-assignment",
  "key-mapping": [
    {
      "payload": [
        {
          "param-name": "service-instance-id",
          "param-value": "${service-instance-id}"
        },
        {
          "param-name": "prefix-id",
          "param-value": "${prefix-id}"
        },
        {
          "param-name": "vf-module-id",
          "param-value": "${vf-module-id}"
        }
      ],
      "output-key-mapping": [
        {
          "resource-name": "protected_private_net_cidr",
```

```
    "resource-value": "${address}"
  }
]
},
{
  "payload": [
    {
      "param-name": "service-instance-id",
      "param-value": "${service-instance-id}"
    },
    {
      "param-name": "prefix-id",
      "param-value": "${prefix-id}"
    },
    {
      "param-name": "vf-module-id",
      "param-value": "${vf-module-id}"
    }
  ],
  "output-key-mapping": [
    {
      "resource-name": "onap_private_net_cidr",
      "resource-value": "${address}"
    }
  ]
},
{
  "payload": [
    {
      "param-name": "service-instance-id",
      "param-value": "${service-instance-id}"
    },
    {
      "param-name": "prefix-id",
      "param-value": "${prefix-id}"
    },
    {
      "param-name": "vf-module-id",
      "param-value": "${vf-module-id}"
    }
  ]
}
```

```
],
"output-key-mapping": [
  {
    "resource-name": "vpg_private_ip_0",
    "resource-value": "${address}"
  }
]
},
{
  "payload": [
    {
      "param-name": "service-instance-id",
      "param-value": "${service-instance-id}"
    },
    {
      "param-name": "prefix-id",
      "param-value": "${prefix-id}"
    },
    {
      "param-name": "vf-module-id",
      "param-value": "${vf-module-id}"
    }
  ],
  "output-key-mapping": [
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      "resource-value": "${address}"
    }
  ]
},
{
  "payload": [
    {
      "param-name": "service-instance-id",
      "param-value": "${service-instance-id}"
    },
    {
      "param-name": "prefix-id",
      "param-value": "${prefix-id}"
    }
  ],
```


```
{
  "param-name": "vf-module-id",
  "param-value": "${vf-module-id}"
}
],
"output-key-mapping": [
  {
    "resource-name": "vfw_private_ip_1",
    "resource-value": "${address}"
  }
]
},
{
  "payload": [
    {
      "param-name": "service-instance-id",
      "param-value": "${service-instance-id}"
    },
    {
      "param-name": "prefix-id",
      "param-value": "${prefix-id}"
    },
    {
      "param-name": "vf-module-id",
      "param-value": "${vf-module-id}"
    }
  ],
  "output-key-mapping": [
    {
      "resource-name": "vfw_private_ip_0",
      "resource-value": "${address}"
    }
  ]
},
{
  "payload": [
    {
      "param-name": "service-instance-id",
      "param-value": "${service-instance-id}"
    },
  ],
```




```
{
  "param-name": "prefix-id",
  "param-value": "${prefix-id}"
},
{
  "param-name": "vf-module-id",
  "param-value": "${vf-module-id}"
}
],
"output-key-mapping": [
  {
    "resource-name": "vsn_private_ip_1",
    "resource-value": "${address}"
  }
]
},
{
  "payload": [
    {
      "param-name": "service-instance-id",
      "param-value": "${service-instance-id}"
    },
    {
      "param-name": "prefix-id",
      "param-value": "${prefix-id}"
    },
    {
      "param-name": "vf-module-id",
      "param-value": "${vf-module-id}"
    }
  ],
  "output-key-mapping": [
    {
      "resource-name": "vsn_private_ip_0",
      "resource-value": "${address}"
    }
  ]
},
{
  "payload": [
```

```
{
  "param-name": "service-instance-id",
  "param-value": "${service-instance-id}"
},
{
  "param-name": "prefix-id",
  "param-value": "${prefix-id}"
},
{
  "param-name": "vf-module-id",
  "param-value": "${vf-module-id}"
}
],
"output-key-mapping": [
  {
    "resource-name": "unprotected_private_net_cidr",
    "resource-value": "${address}"
  }
]
}
]
}
]
```

## Controller Design Studio Functionality Demo:

 Unknown macro: 'widget'

 Unknown macro: 'widget'

 Unknown macro: 'widget'