

Silver Peak Best Practice Guidelines: Template Groups and Templates 101

This guide provides some basic information and general guidance about using templates and template groups in Silver Peak Unity Orchestrator.

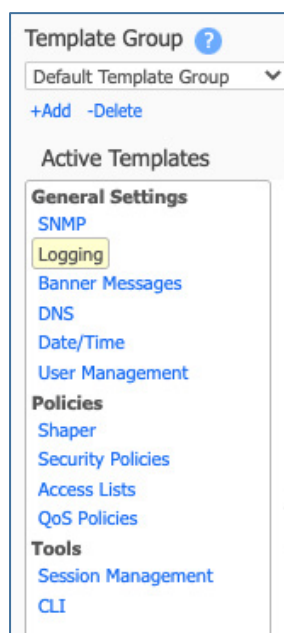
✓ Do – Use templates for all fabric configurations

Avoid snowflake configurations in your network by using template groups and templates to apply configurations consistently to every appliance in your SD-WAN fabric.

✓ Do – Use *Default Template Group* for global configuration settings

The *Default Template Group* cannot be removed, it is a recommended best practice to put all global appliance configuration items into the *Default Template Group*, including *Security Policy*, *Access-Lists*, *Shaper*, and *QoS*, as these are typically standard across the network.

A typical *Default Template Group* might look like the following:



✓ **Do – Use additional template groups for different configurations across appliance groups**

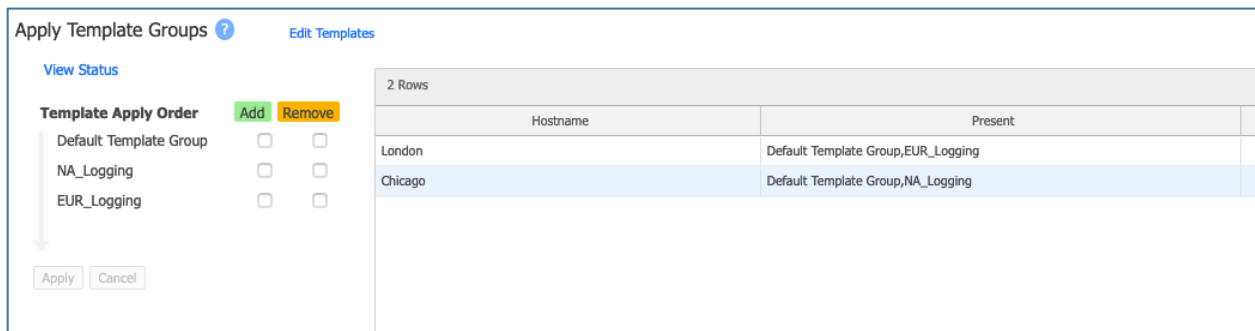
Multiple template groups can be created, each containing different templates and different attributes of those templates. Additionally, each appliance or groups of appliances, can have multiple template groups applied to them.

See [Multiple Template Groups – Example](#) section for more information.

✓ **Do – Pay attention to the *Template Apply Order***

Template groups are applied to the appliances based on the *Template Apply Order*.

Note: *The last template group in the list will be the final configuration applied to the appliance.*



The screenshot shows the 'Apply Template Groups' interface. On the left, there is a 'Template Apply Order' section with three items: 'Default Template Group', 'NA_Logging', and 'EUR_Logging'. Each item has an 'Add' checkbox and a 'Remove' checkbox. Below this list are 'Apply' and 'Cancel' buttons. On the right, there is a table with 2 rows. The table has two columns: 'Hostname' and 'Present'. The first row is for 'London' and the second row is for 'Chicago'. The 'Present' column for 'London' contains 'Default Template Group, EUR_Logging' and for 'Chicago' it contains 'Default Template Group, NA_Logging'.

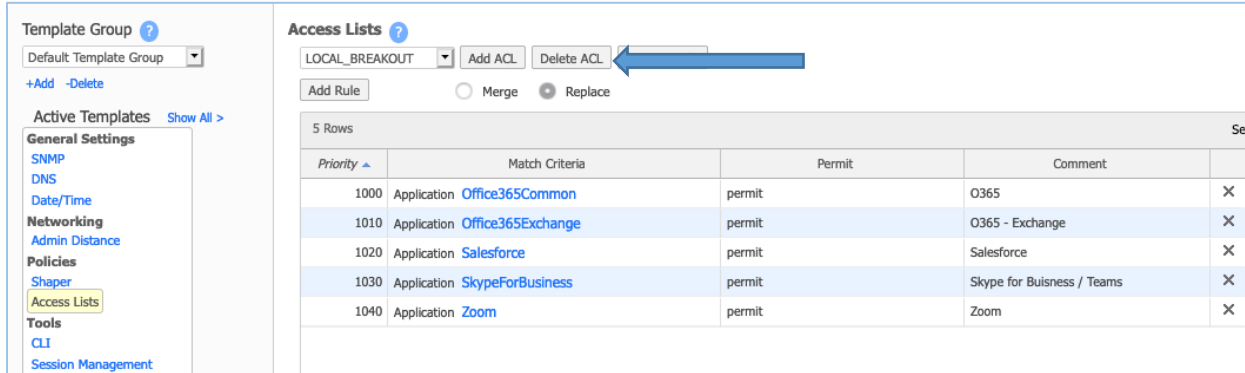
Hostname	Present
London	Default Template Group, EUR_Logging
Chicago	Default Template Group, NA_Logging

This order can be changed by simply dragging and dropping the template groups into the desired order. It is recommended to use the *Default Template Group* and keep it at the top of the list.

See [Apply Template Groups – Behavior](#) and [Multiple Template Groups – Example](#) for more information.

✓ Do – Use *Replace* if available

Using the *Replace* option will replace the configuration contained in the template on the appliance when any changes are made to the template. This ensures that the configuration is always consistent with the template.



The screenshot shows the 'Access Lists' configuration page in the Silver Peak management console. The left sidebar contains navigation options like 'Template Group', 'Active Templates', and 'General Settings'. The main area shows the 'Access Lists' configuration with a dropdown menu set to 'LOCAL_BREAKOUT'. Below the dropdown are buttons for 'Add ACL' and 'Delete ACL', with a blue arrow pointing to the 'Delete ACL' button. There are also radio buttons for 'Merge' and 'Replace', with 'Replace' being selected. Below this is a table with 5 rows of access list entries.

Priority	Match Criteria	Permit	Comment	Se
1000	Application Office365Common	permit	O365	×
1010	Application Office365Exchange	permit	O365 - Exchange	×
1020	Application Salesforce	permit	Salesforce	×
1030	Application SkypeForBusiness	permit	Skype for Business / Teams	×
1040	Application Zoom	permit	Zoom	×

✓ Do – Make template changes in a limited scope for testing/validation of changes

Global changes applied via templates can be service impacting. It is recommended to make changes that are globally significant to a small portion of the network to ensure there is no service disruption related to the changes.

✘ Do Not - Use Merge

Using the *Merge* option allows changes in the template to be merged with what is currently in place on the appliance, which can lead to configuration inconsistencies. The use of *Merge* should be **avoided** in most cases.

✘ Do Not - Use System in templates

Typically, there is no reason to include the *System* template inside any template group.

✘ Do Not - Make changes locally on an appliance *

Templates ensure consistency of configurations across your entire fabric, local changes to an appliance are unnecessary, except for the following:

1. Deployment – Each appliance has a unique deployment configuration which consists of IP addressing, Labels, Bandwidth, and Boost.
2. Routing and VRRP – BGP, OSPF, VRRP, and Multicast configurations are typically unique to each appliance.
3. VTI and Passthrough Tunnels – 3rd Party IPsec tunnels and VTIs are unique to each appliance.

All items noted above can be configured manually or through *Preconfiguration*, which can be used to model each of these unique configurations inside a YAML file stored on the Orchestrator. These configurations can be used to model everything on the appliance, or just to add/update parts of the configuration.

For more information on Preconfiguration, see the Orchestrator User Guide [here](#).

**Do Not – Modify or Remove *CLI* or *Session Management* from *Default Template Group***

The *CLI* and *Session Management* templates inside the *Default Template Group* are there to apply best practice appliance hardening configurations.

- Session Management – This is set to enable only HTTPS for the appliance UI.
- CLI – This is set to apply *ssh server listen interface lo*, which ensures that the SSH server on the appliance does not listen on any WAN interface.

Apply Template Groups – Behavior

Use of templates within the Orchestrator is a powerful tool and allows network operators to maintain consistency across the network footprint. It is very important to understand the behavior of how templates are applied, and what actions trigger an update or synchronization of configuration in a template.

Templates are always pushed in a top down manner from the Orchestrator to the appliances, and in the order of priority based on the *Template Apply Order*.

The follow table details the actions that will trigger an application or re-application of the template configuration.

Event	Action	Result
Appliance Reboot	All associated template groups are re-applied to appliance, based on the <i>Template Apply Order</i> .	Any local changes to the appliance that are part of a template group will be corrected by the Orchestrator.
Orchestrator Reboot	All associated template groups are re-applied to all associated appliances .	Any local changes to the appliance that are part of a template group will be corrected by the Orchestrator.
Add, change, delete new template group, <u>not</u> applied to any appliance(s).	<i>No Action.</i> ¹	None.
Add, change, delete template group, applied to appliance(s).	All associated template groups are re-applied to all associated appliances , based on the <i>Template Apply Order</i> .	Any local changes to the appliance that are part of a template group will be corrected by the Orchestrator.
Apply template group to a previously non-associated appliance.	All associated template groups are re-applied to newly associated appliance(s) , based on the <i>Template Apply Order</i> .	Any local changes to the appliance that are part of a template group will be corrected by the Orchestrator.
Remove template group from associated appliance.	Template association is removed within Orchestrator.	Any configuration that was part of the template remains in-place on the appliance , but any future updates to the template will not be applied.

Note: *The above table is based on Orchestrator 8.10 or later, previous versions of Orchestrator may have a few differences in behavior. Please see the release notes for more information.*

Multiple Template Groups – Example

Let's consider a network that consists of appliances deployed in North America, Europe, and Asia.

- Appliances in North America should point to a regional syslog collector (IP = 1.2.3.4)
- Appliances in Europe should point to a different collector (IP = 4.5.6.7)
- Appliances in Asia should point to the global collector (IP = 8.9.10.11), which is configured in the Default Template Group

To accomplish this, you would add two new template groups:

The image shows two side-by-side screenshots of a configuration interface. The left screenshot is titled 'NA_Logging' and the right is 'EUR_Logging'. Both show the 'Logging' configuration page with the following settings:

- Log Configuration:** Minimum severity level: Notice; Start new file when log reaches: 50 (1-50 MB); Keep at most log files: 30 (1-100).
- Log Facilities Configuration:** System: local1; Audit: local0; Flow: local2.
- Remote Log Receivers:** A table with columns: Remote Receiver, Minimum Severity, Facility. The NA_Logging group has a receiver at 1.2.3.4 with severity Notice and facility all. The EUR_Logging group has a receiver at 4.5.6.7 with severity Notice and facility all.

Blue arrows point to the 'Remote Log Receivers' table in both screenshots.

Once configured, we can apply the EUR_Logging template group to our Europe appliances and NA_Logging to our North America appliances.

The screenshot shows the 'Apply Template Groups' interface. On the left, there is a 'Template Apply Order' list with three items: Default Template Group, NA_Logging, and EUR_Logging. Each item has an 'Add' button (green) and a 'Remove' button (orange). Below the list are 'Apply' and 'Cancel' buttons. On the right, there is a table with 3 rows and 2 columns: Hostname and Present.

Hostname	Present
London	Default Template Group, EUR_Logging
Chicago	Default Template Group, NA_Logging
Hong-Kong	Default Template Group

This will point the North America appliances to the logging server at 1.2.3.4, and the Europe appliances to 4.5.6.7. Any other appliances will continue to use the logging server configured in the Default Template group, which is 8.9.10.11.

Multiple Template Groups – Example (continued)

Focusing more on multiple template groups, the image below shows the *Apply Template Groups* page from an example Orchestrator:

The screenshot shows the 'Apply Template Groups' interface. On the left, there is a 'Template Apply Order' list with checkboxes for 'Add' and 'Remove' for each group: Default Template Group, Hub_Defaults, Spoke_Defaults, PST_PDT, MST_MDT, CST_CDT, and EST_EDT. Below this list are 'Apply' and 'Cancel' buttons. On the right, a table displays 14 rows of appliances. The table has two columns: 'Hostname' and 'Present'. The 'Present' column lists the template groups applied to each appliance, such as 'Default Template Group, Hub_Defaults, PST_PDT' for DC1-ECV-01.

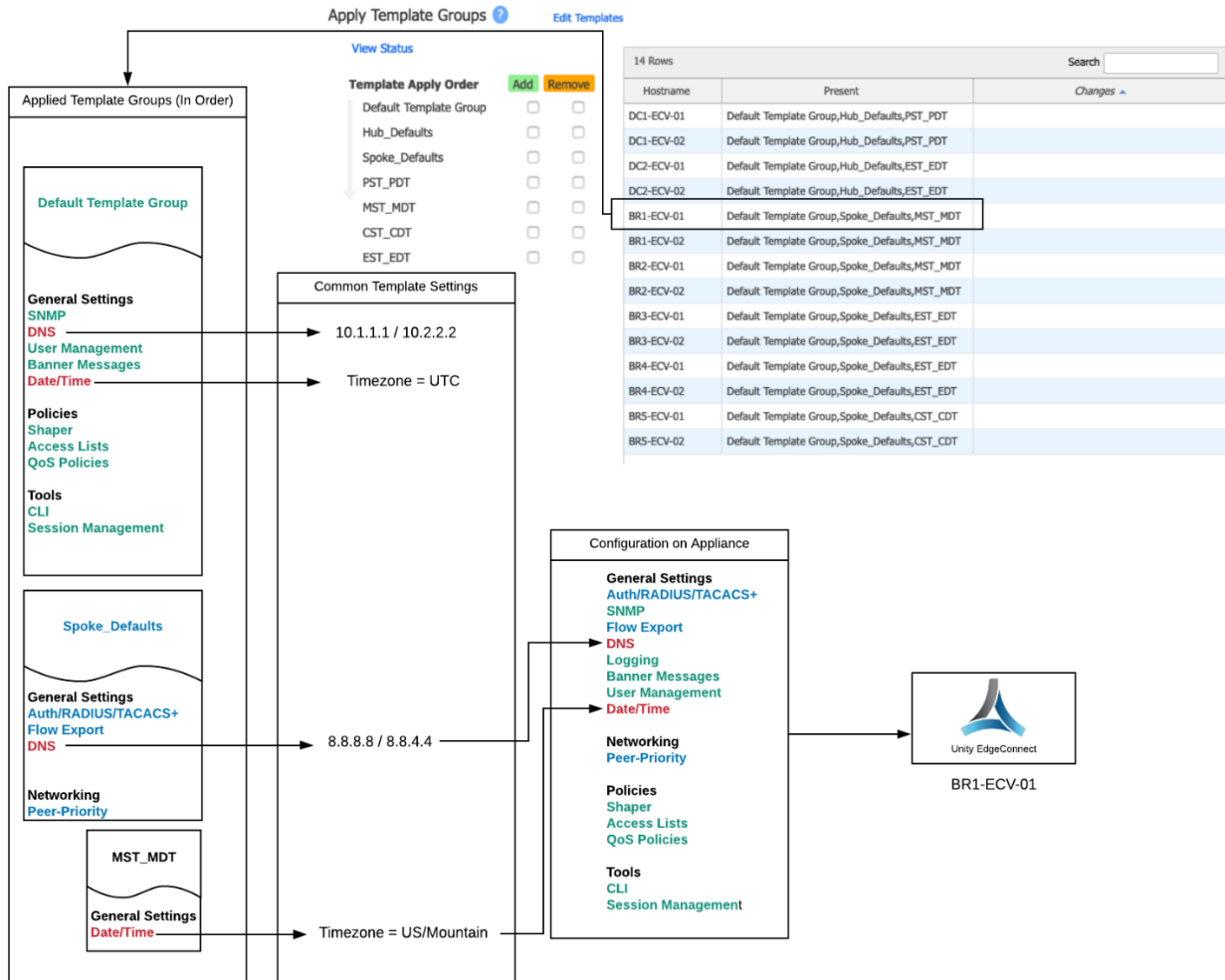
Hostname	Present
DC1-ECV-01	Default Template Group, Hub_Defaults, PST_PDT
DC1-ECV-02	Default Template Group, Hub_Defaults, PST_PDT
DC2-ECV-01	Default Template Group, Hub_Defaults, EST_EDT
DC2-ECV-02	Default Template Group, Hub_Defaults, EST_EDT
BR1-ECV-01	Default Template Group, Spoke_Defaults, MST_MDT
BR1-ECV-02	Default Template Group, Spoke_Defaults, MST_MDT
BR2-ECV-01	Default Template Group, Spoke_Defaults, MST_MDT
BR2-ECV-02	Default Template Group, Spoke_Defaults, MST_MDT
BR3-ECV-01	Default Template Group, Spoke_Defaults, EST_EDT
BR3-ECV-02	Default Template Group, Spoke_Defaults, EST_EDT
BR4-ECV-01	Default Template Group, Spoke_Defaults, EST_EDT
BR4-ECV-02	Default Template Group, Spoke_Defaults, EST_EDT
BR5-ECV-01	Default Template Group, Spoke_Defaults, CST_CDT
BR5-ECV-02	Default Template Group, Spoke_Defaults, CST_CDT

This configuration contains seven template groups, each containing templates that have been configured based on the appliance role, administrative requirements, geographic location, etc.

These seven template groups are applied to the appliances as shown below:

Template Group Name	Appliances Template Group is Applied to?
Default Template Group	Applied to ALL appliances in the SDWAN fabric.
Hub_Defaults	Applied to All Hub appliances in the SDWAN fabric, and NOT applied to Spoke appliances.
Spoke_Defaults	Applied to All Spoke appliances in the SDWAN fabric, and NOT applied to Hub appliances.
PST_PDT	Applied to all appliances in the Pacific Time Zone.
MST_MDT	Applied to all appliances in the Mountain Time Zone.
CST_CDT	Applied to all appliances in the Central Time Zone.
EST_EDT	Applied to all appliances in the Eastern Time Zone.

Now, understanding which appliances the template groups are applied to, here is a breakdown of final appliance configuration, when the same templates are part of multiple template groups.



Looking at the example above, the *Default Template Group* contains DNS and Date/Time, *Spoke_Defaults* contains DNS with different values than the *Default Template Group*, and the last template group *MST_DST* contains Date/Time with different values than the *Default Template Group*.

All the unique templates from each template group are consolidated and applied to the appliance for common template configuration between template groups. The last template group in the *Apply Order* will be the final configuration on the appliance.

Appendix A: Template Options

The following table provides additional details about whether templates are recommended in the default group or in a new or separate group.

General Settings	Default Template Group	Separate Template Group	Notes
System	No	Case-by-case	Normally not needed in a template, but some environments could require it. Best practice is to separate by hubs vs spokes.
Auth/Radius/TACACS+	Yes		For local appliance authentication via HTTPS/SSH.
SNMP	Yes	Case-by-case	For appliance SNMP, which is disabled by default.
Flow Export	Yes		Typically global, but this could be configured in a region-specific template.
DNS			
Logging			
Banner Messages			
HTTPS Certificate	No	Case-by-case	For the local appliance WebUI certificate.
User Management	Yes		Global configuration of local accounts for "password of last resort" access is recommended. This allows for easy lifecycle management of local passwords.
Date/Time	Case-by-case		Some deployments use a global time standard; others require appliance time to be based on physical location.
Overlays			
SSL Certificates	Case-by-case		Needed for SSL Decryption/WAN Op only.
SSL CA Certificates			
SSL for SaaS			
Networking			
Tunnels	No	No	Deprecated – not used with Overlays.
VRRP	No	Case-by-case	Typically configured per site, but you could use this to set a global standard for "VRRP_Primary" and "VRRP_Secondary."
Peer Priority	No	Yes	Typically set on branches for selecting a preferred peer when multiple duplicate routes are present.
Admin Distance	No	Yes	Admin distance is often configured differently for hub vs. spoke appliances – varies based on environment.
Routes	No	Yes	Desired routes are often configured differently for hub vs. spoke appliances – varies based on environment
Policies			
Shaper	Yes		Typically global, should remain global.
User Defined Apps	No	No	Deprecated – use Application Definitions in Orchestrator.
Access Lists	Yes		Typically global, should remain global.
Route Policies	No	Case-by-case	Templatized or manual route policies should be avoided as the overlay should take care of this. Route polices will typically be used only for troubleshooting purposes.
QoS Policies	Yes		Typically global, should remain global.
Optimization Policies			
SaaS NAT Policies	No	Case-by-case	If SaaS Optimization is used, hubs may have a different configuration than spokes.

General Settings	Default Template Group	Separate Template Group	Notes
Threshold Crossing Alerts	No	Yes	TCAs can be customized by region; including these in a region-specific template may be desired.
SaaS Optimization	No	Case-by-case	If SaaS Optimization is used, hubs may have a different configuration than spokes.
Security Policies	Yes		Typically global, should remain global.
DNS Proxy Policies			
Management Services			
Tools			
CLI	Yes		Typically global, should remain global.
Session Management			