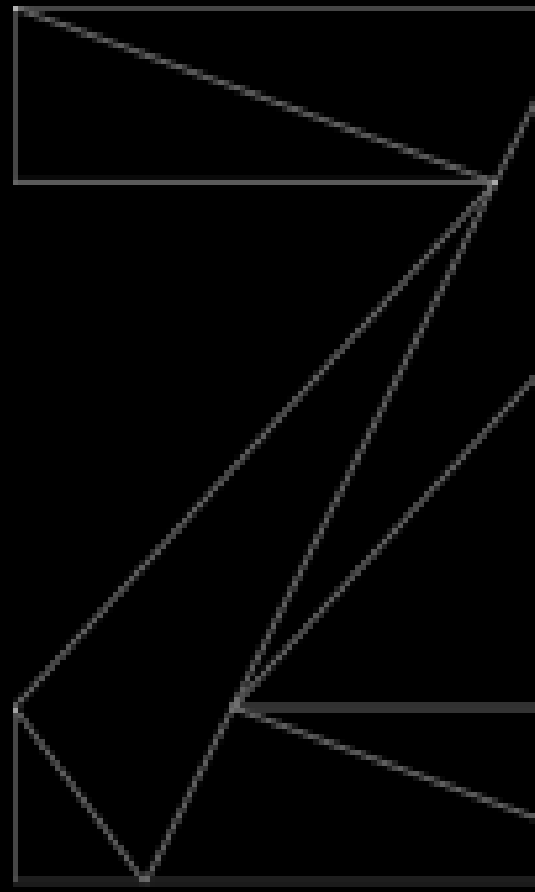
Change set



IBM z

Change set

VARY OBEY is supported in Network Configuration Assistant by introducing a new configuration object called a “Change Set”

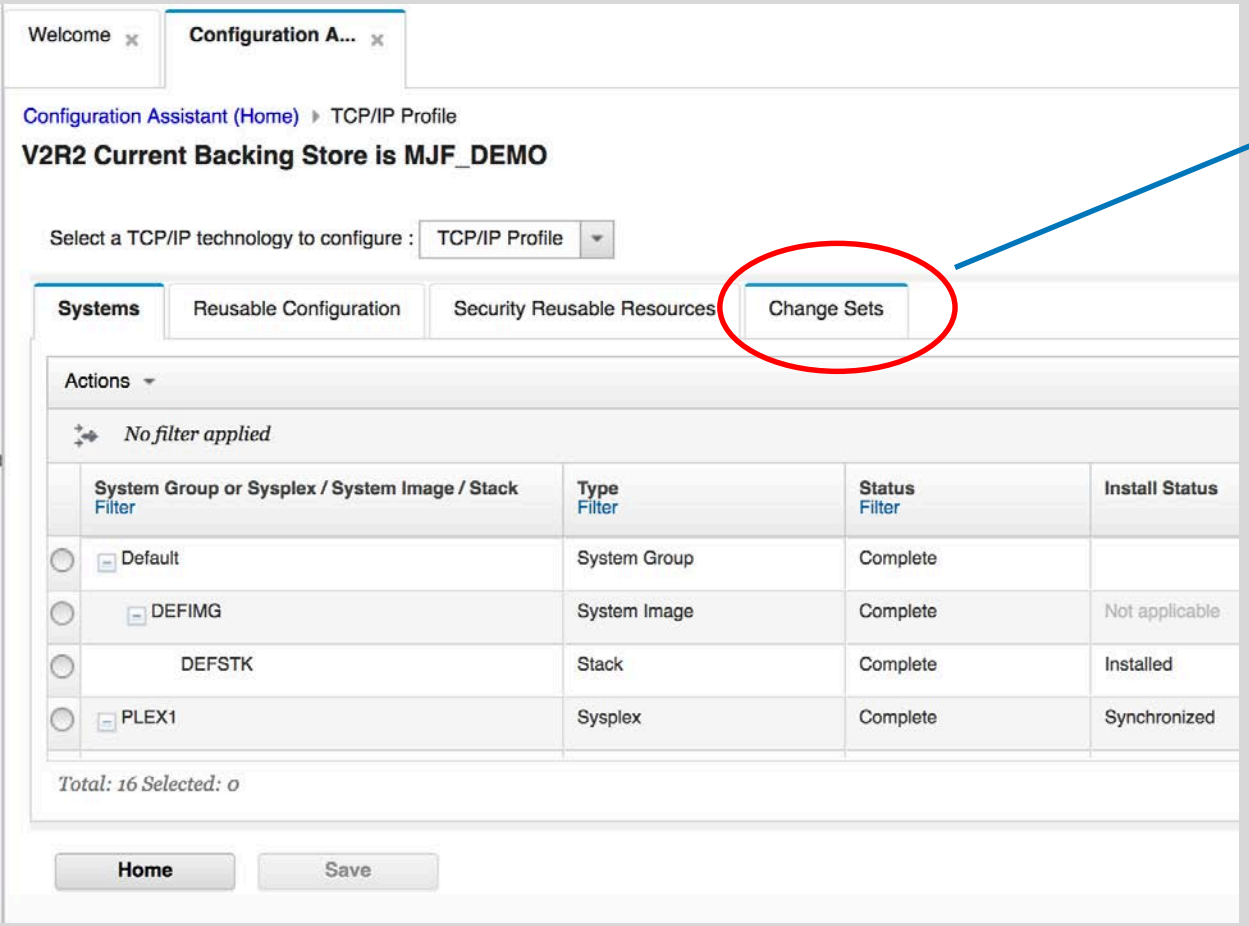
- You create a change set based on an existing configuration object
  - a stack or group of stacks, or
  - a reusable configuration, or
  - a sysplex
- The change set is seeded with the configuration from the object it’s based on.
- You edit the change set to make the configuration changes you want.
- When you install the change set, Network Configuration Assistant will generate the VARY OBEY files necessary to put the changes you made into effect.
- The VARY OBEY files, once placed onto the system are manually applied by the operator
  - Provides an opportunity for review of the OBEY files before they are applied to production systems. Customer feedback indicated this was important.

Additional change set capabilities

- You can undo a change set
  - This will create the OBEY files necessary to put the configuration back the way it was before any edits were made in the change set
    - This supports the use case of making a temporary change that can easily be removed.
      - Or to back off an erroneous change!

- You can merge change sets into the base
  - Once the OBEY files are applied this makes the change permanent
  - Customer feedback indicated to us that the main use case was to create an OBEY file, apply the change, then update the base configuration to reflect that change
    - For example: add a PORT reservation for a new application

Change sets are accessible from the TCP/IP systems tree



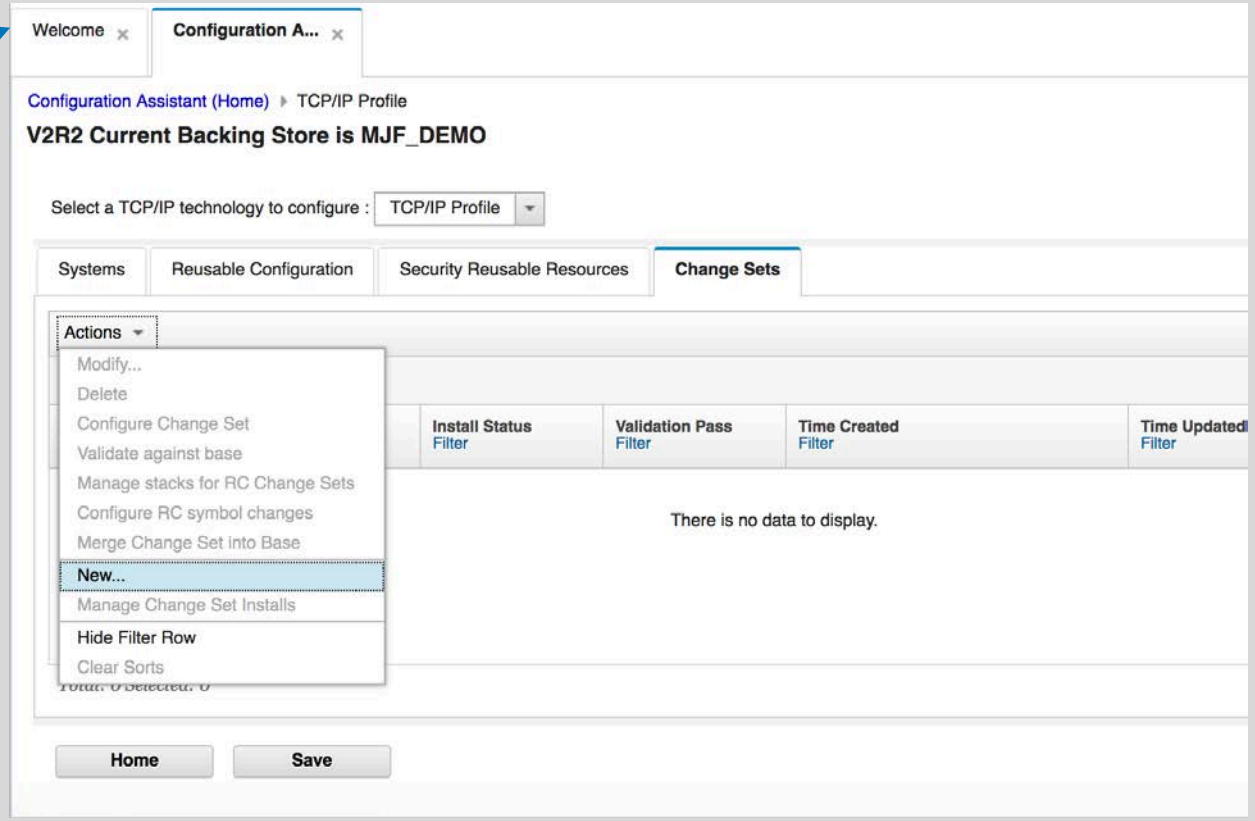
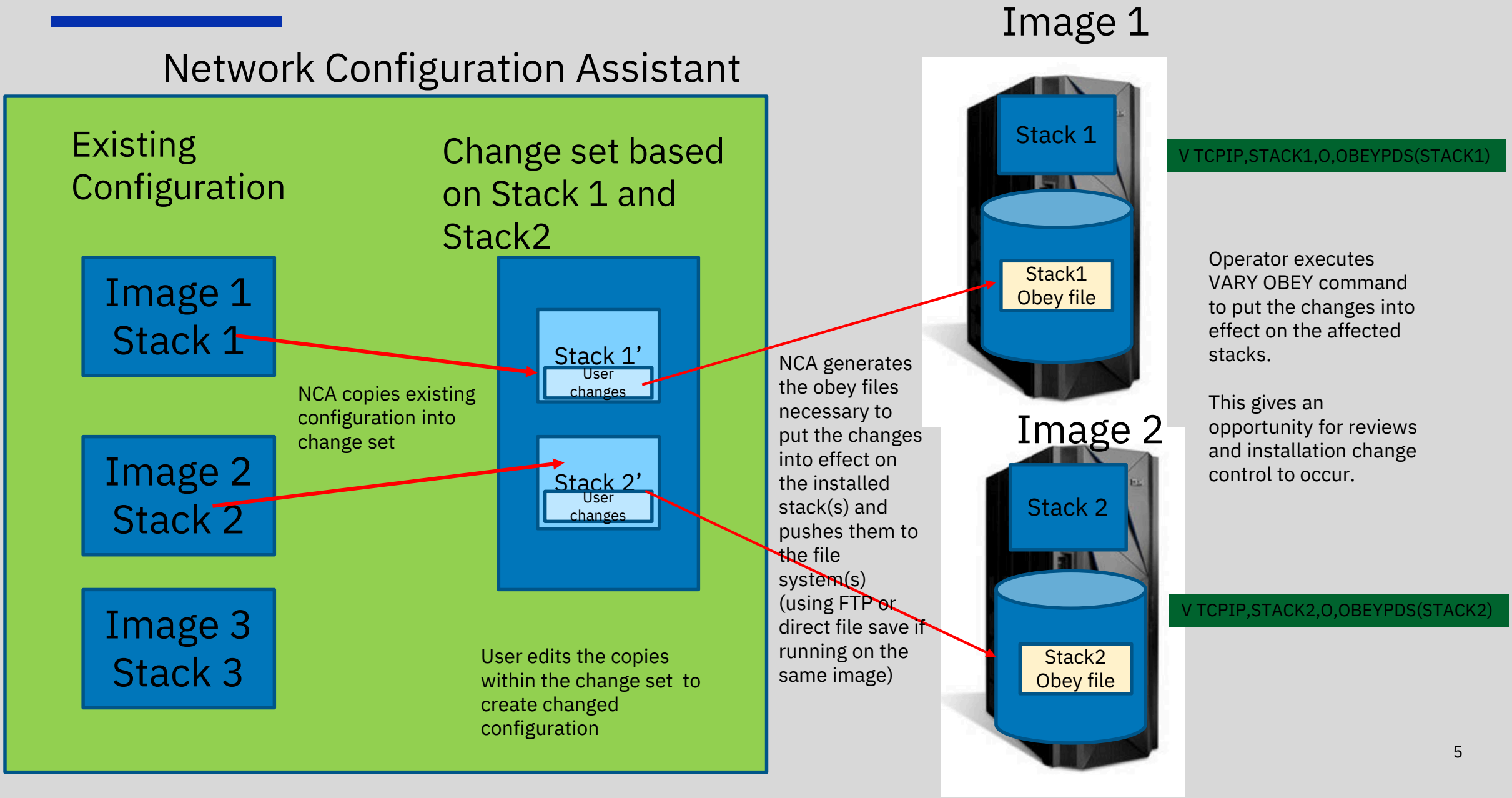
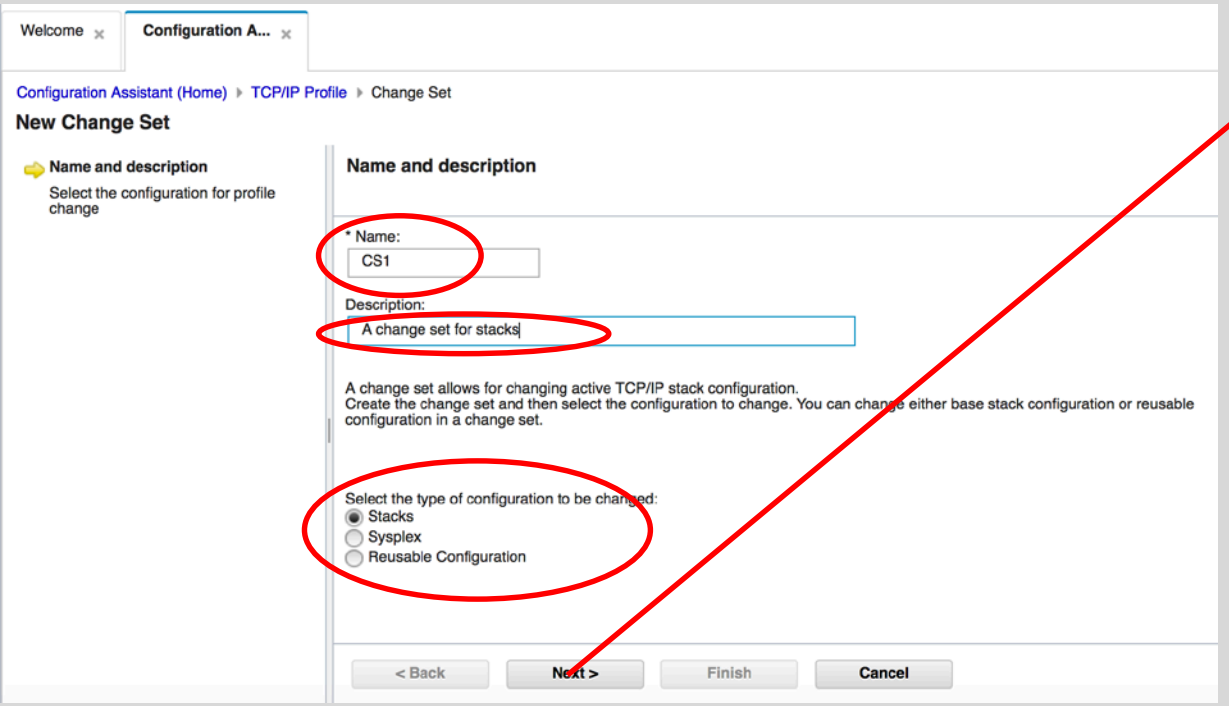
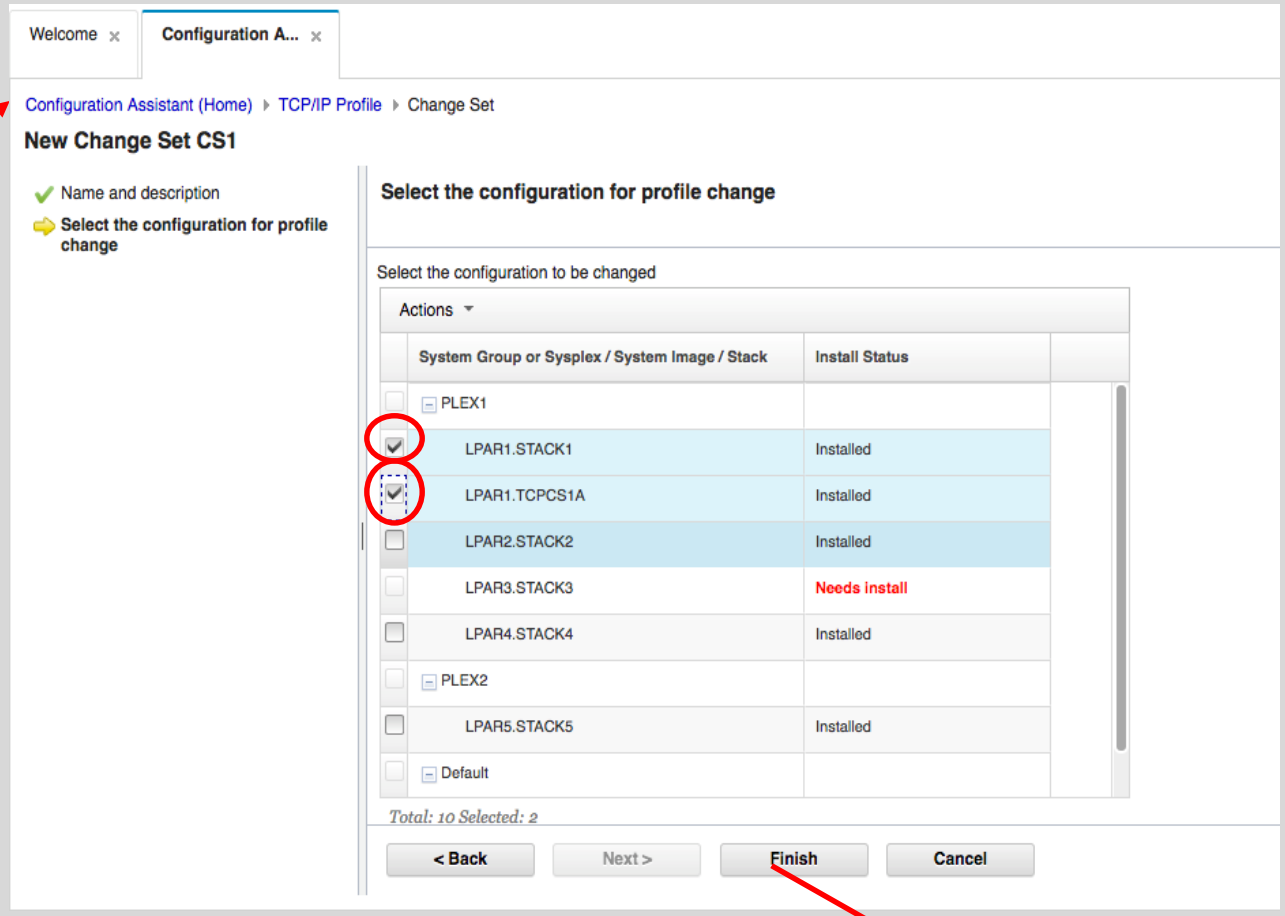


Illustration: Change sets based on TCP/IP stacks



Create a stack change set

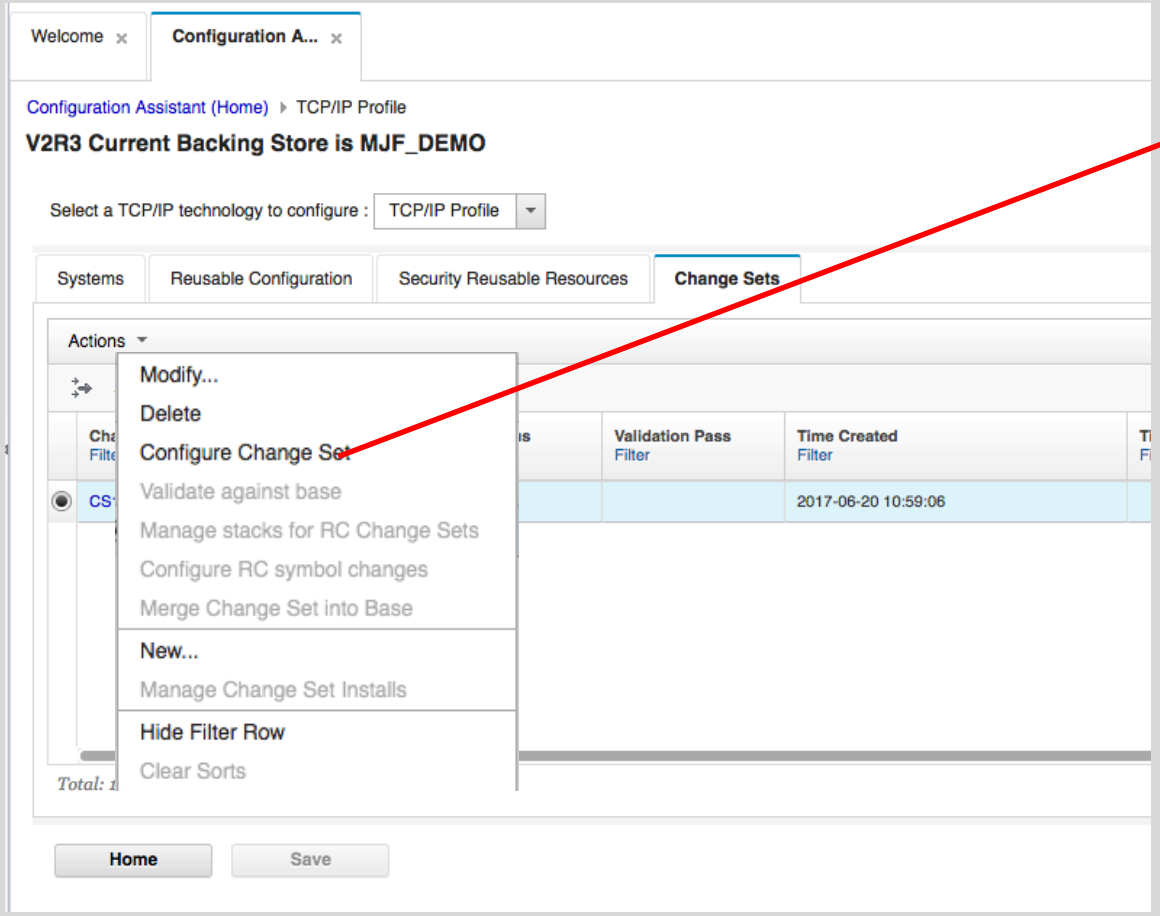


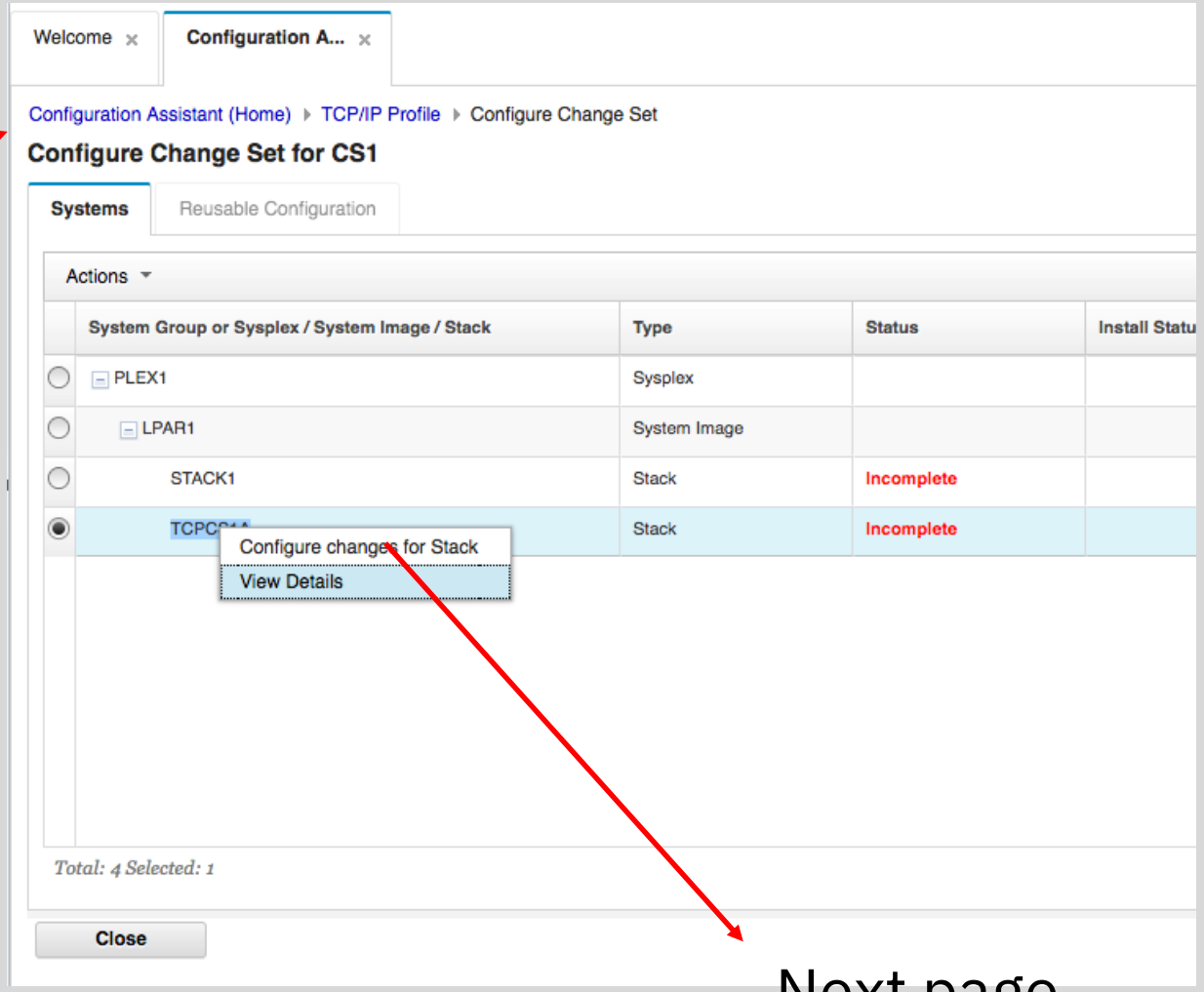


- A stack change set can be based on one or more stacks
- A stack change set can only be based on stacks that are installed (note that LPAR3.STACK3 is not available for selection!)

Next page

Edit created stack change set

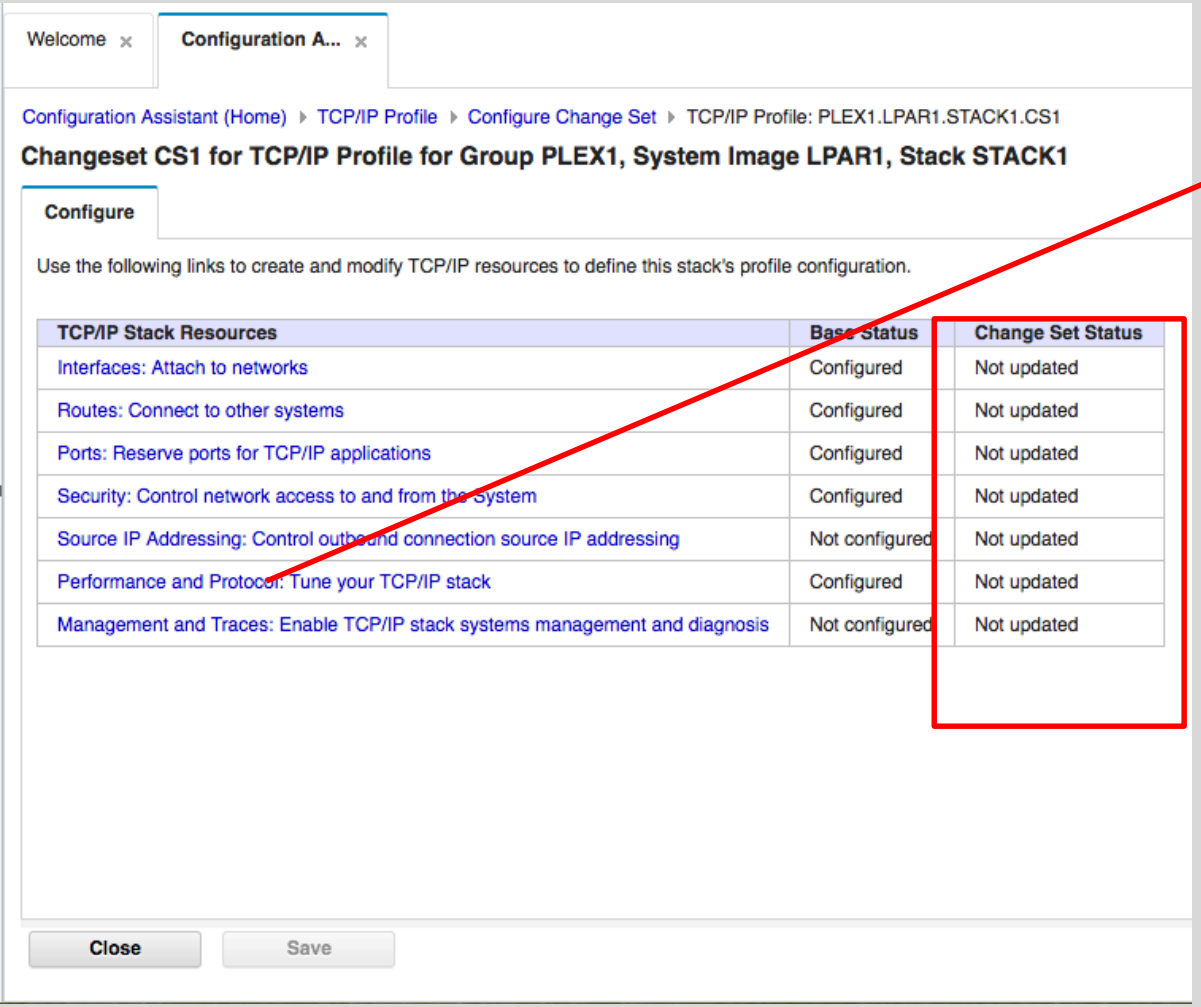


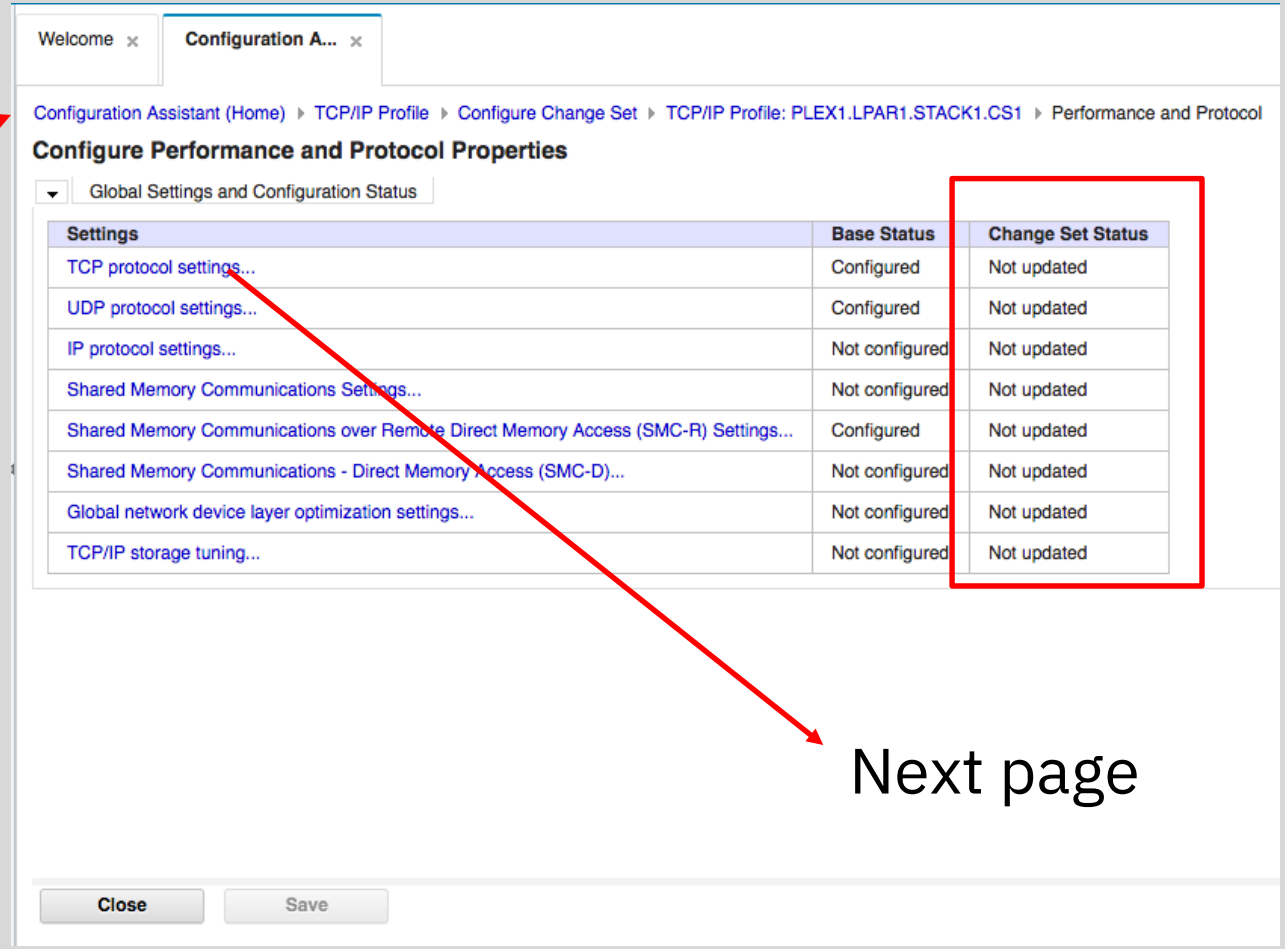


If there are multiple stacks in a change set, you edit them one at a time

Next page

Editing a stack in a change set

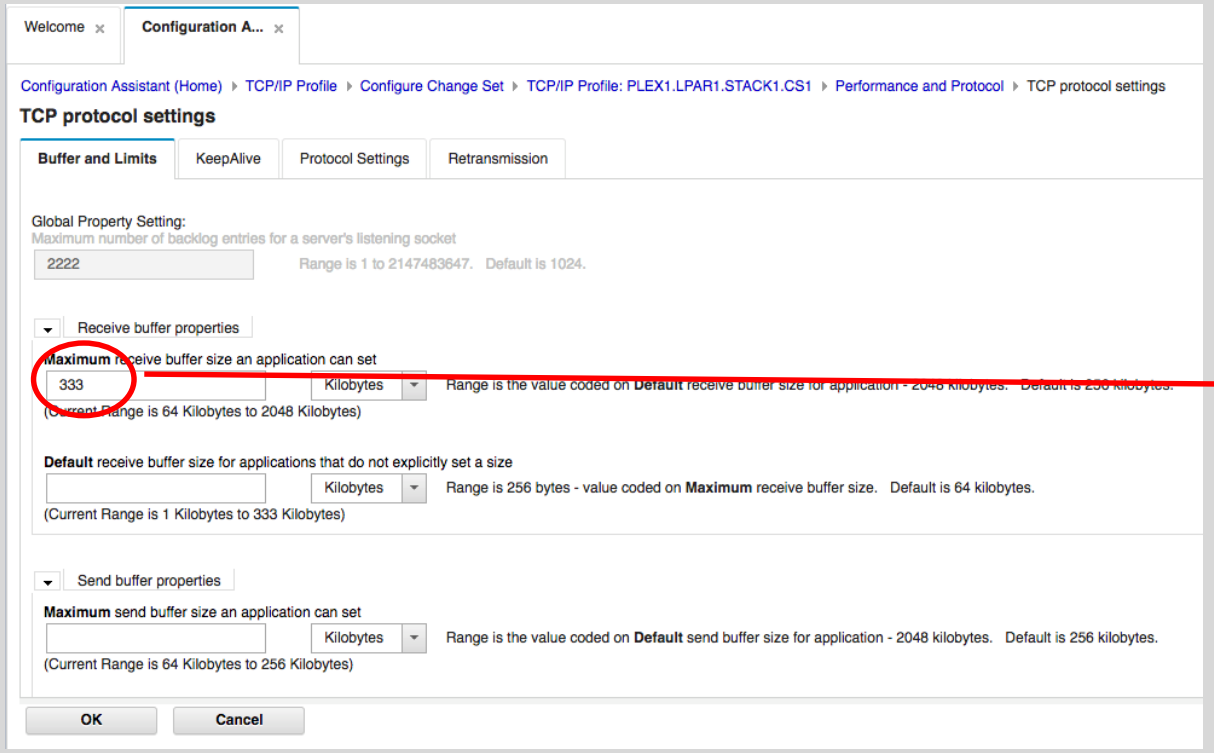


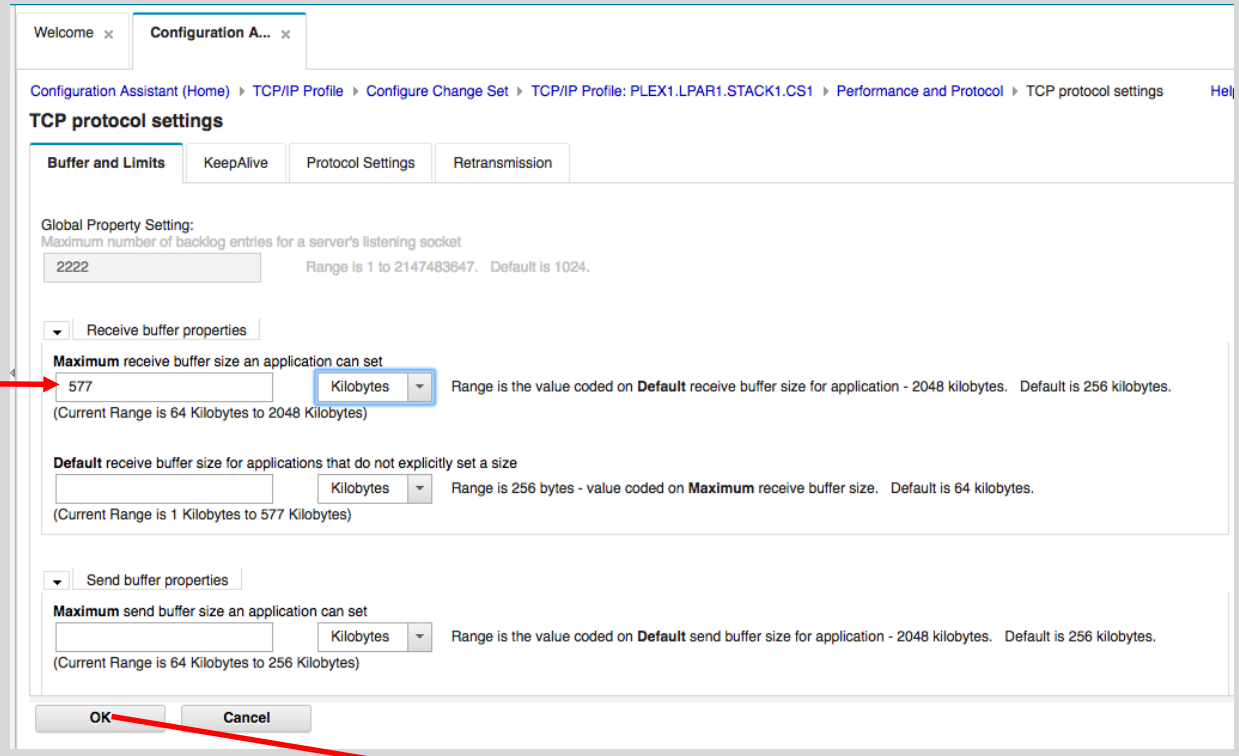


To configure changes, Simply edit the stack as you would normally using the GUI

"Change Set Status" column indicates where changes have been made

Change a parameter for the change set

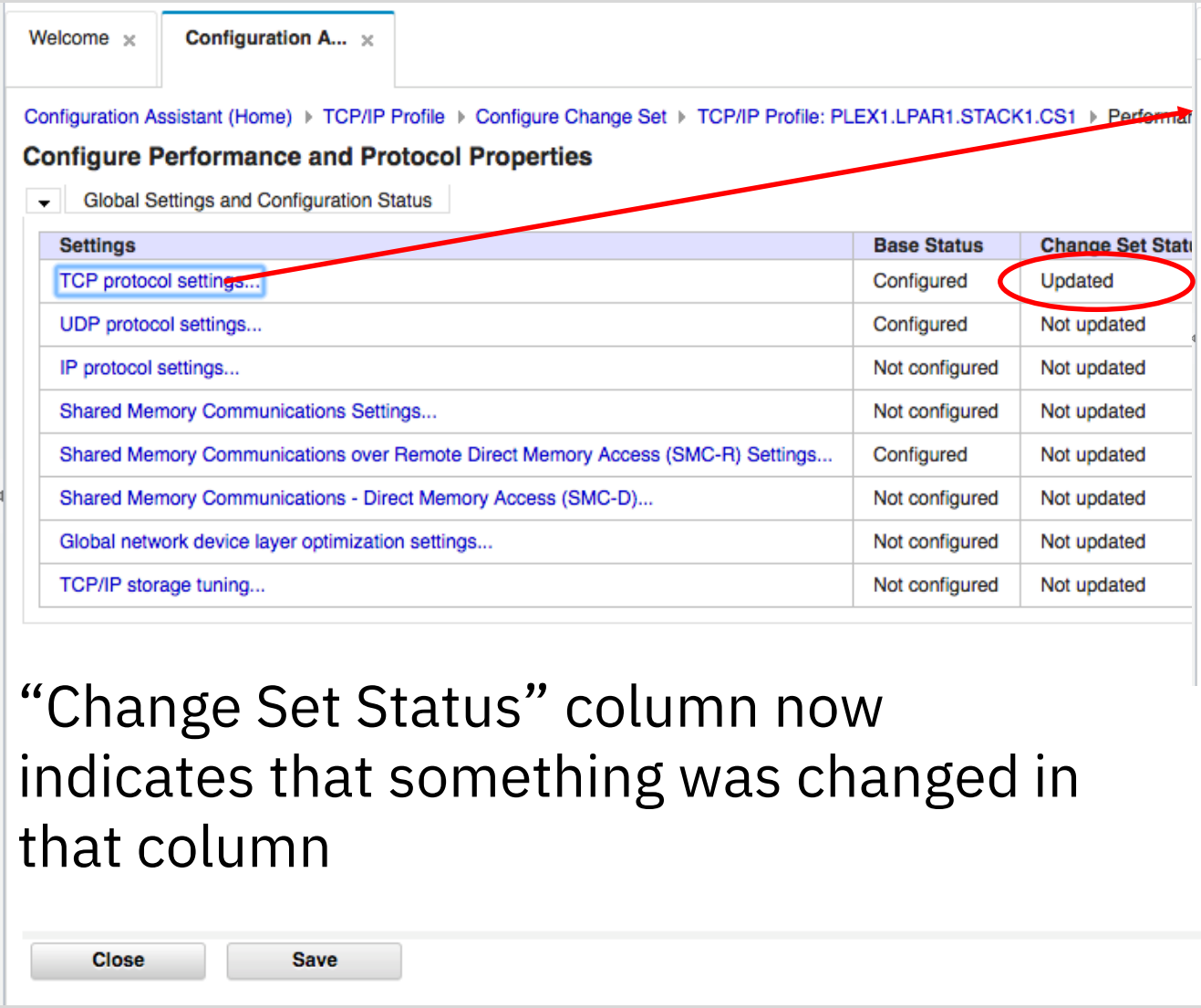


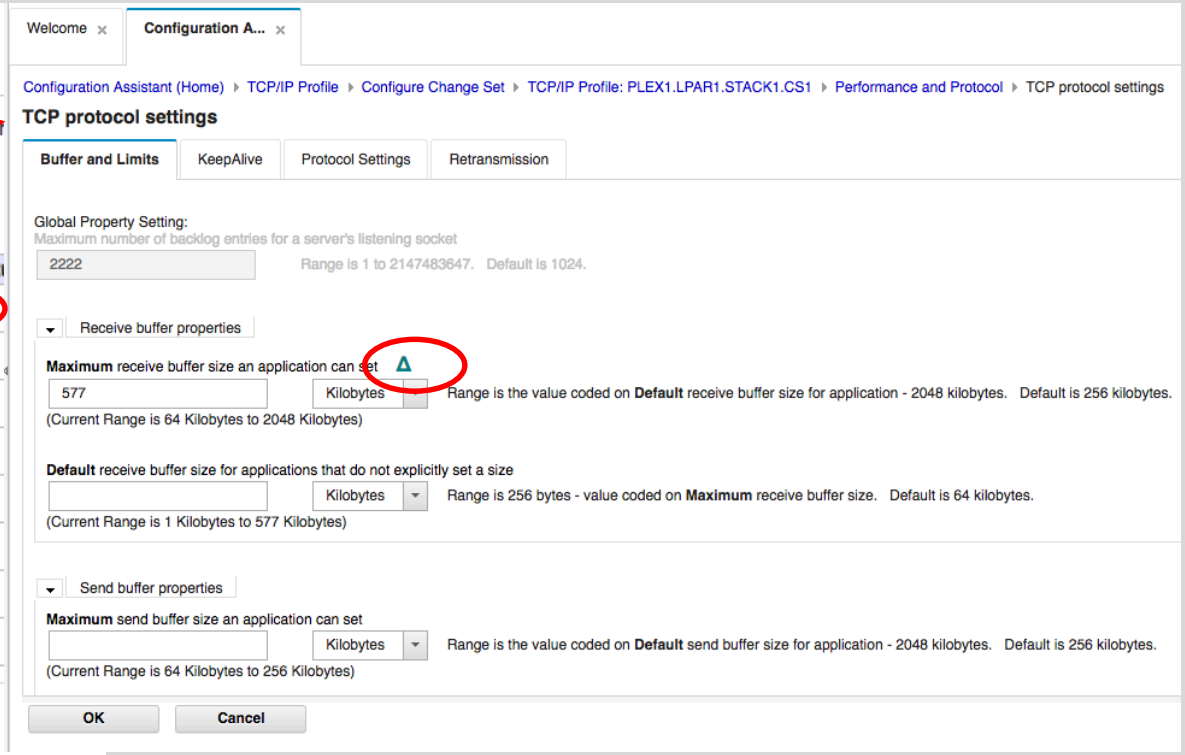


In this example, we simply edited the Maximum receive buffer value, changing it from 333 to 577 kilobytes

Next page

Seeing what updates were made

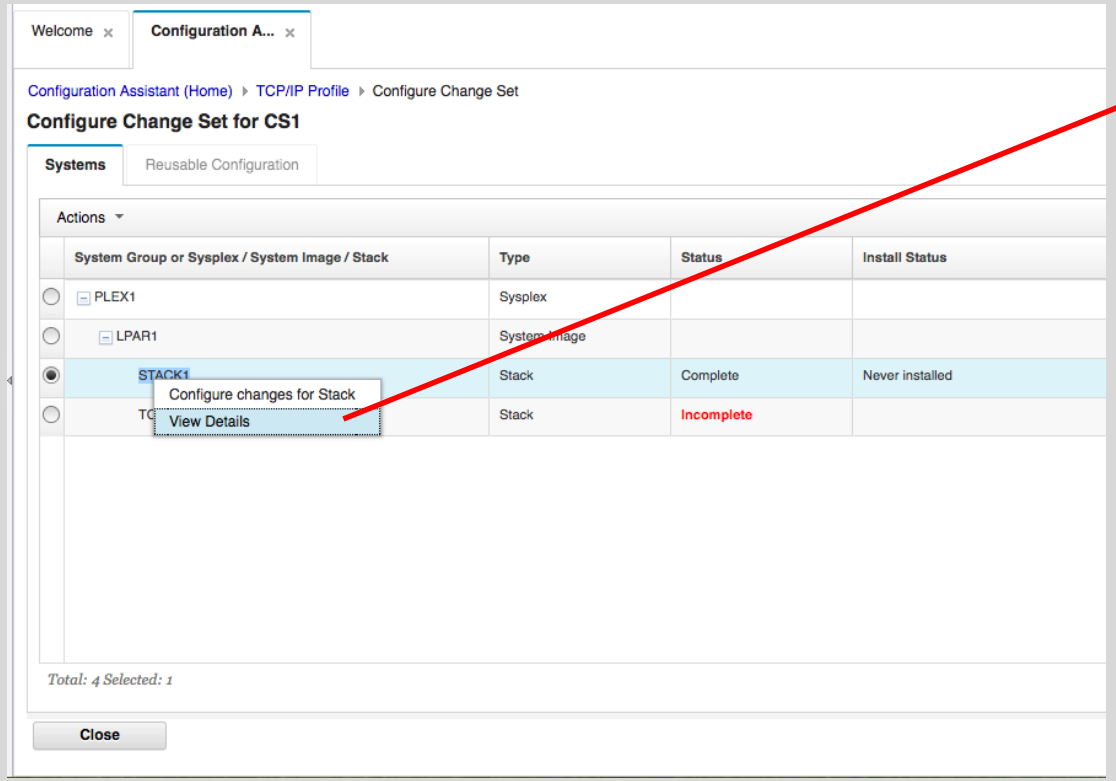




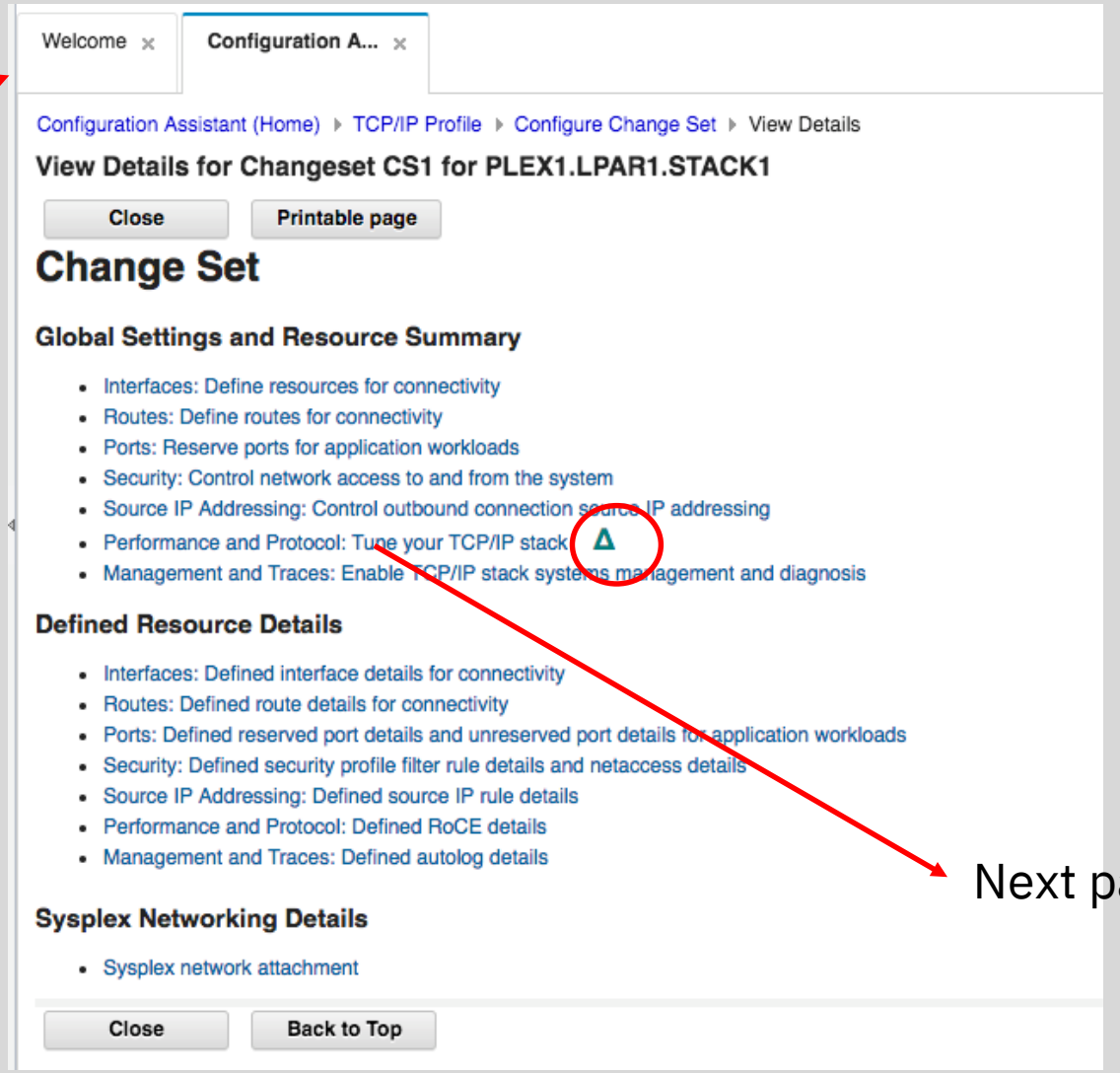
"Change Set Status" column now indicates that something was changed in that column

Green Delta flags help you pick out what's changed on a panel

To compare old and new values, use View Details

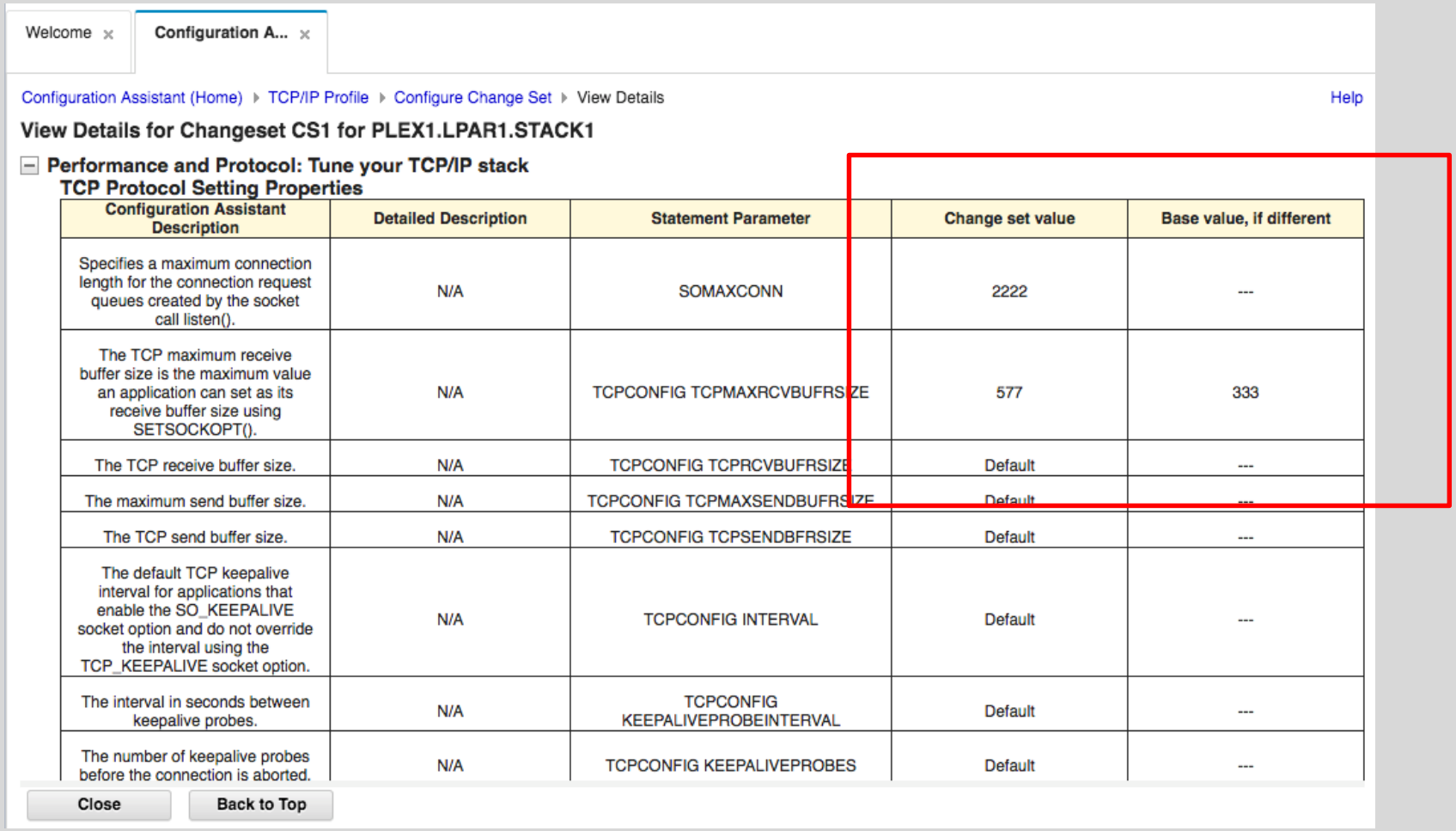


On the change set configuration screen, View Details gives you an easy before and after view of a stack being changed



Next page

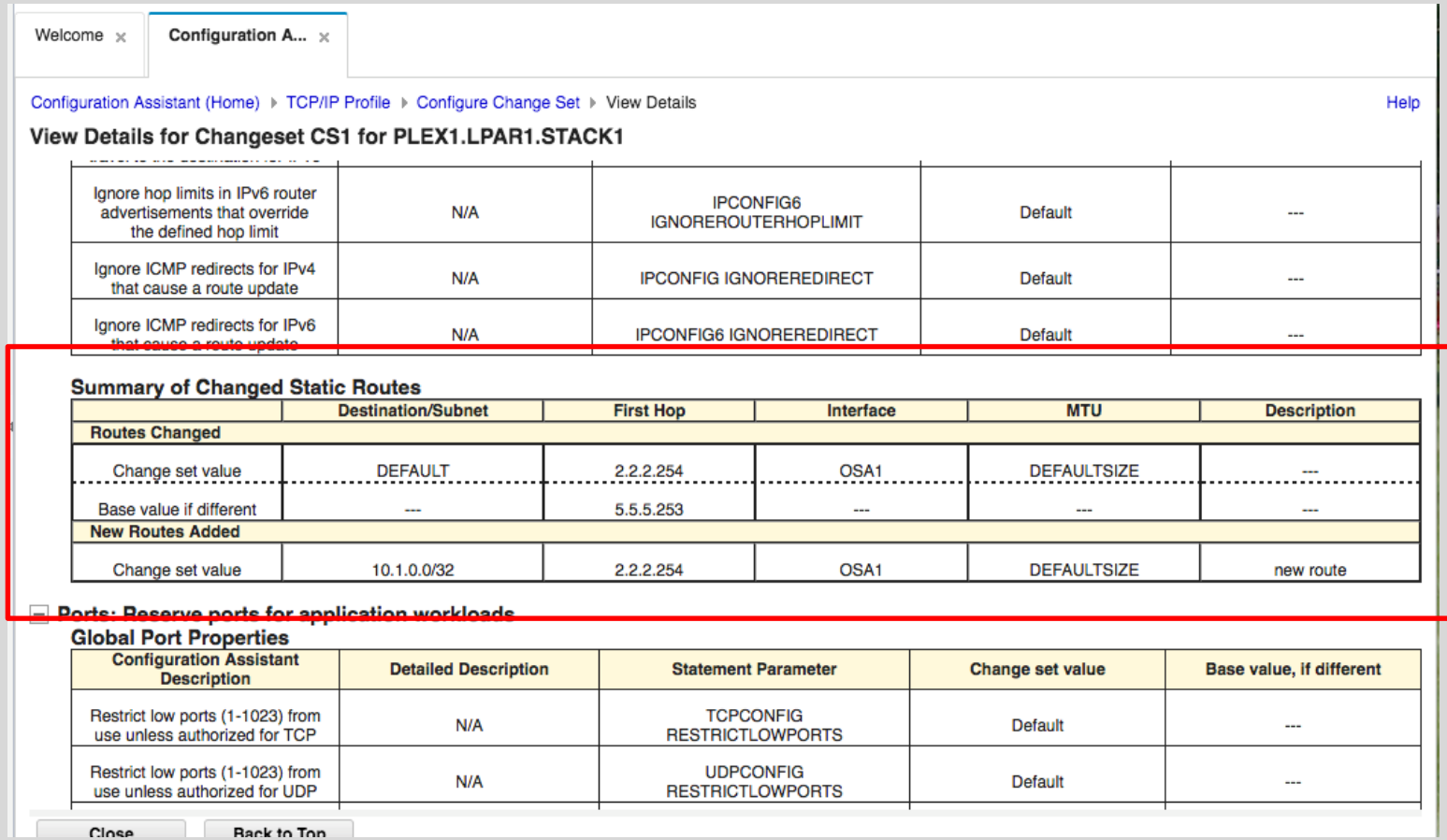
View details comparison



Configuration Assistant Description	Detailed Description	Statement Parameter	Change set value	Base value, if different
Specifies a maximum connection length for the connection request queues created by the socket call listen().	N/A	SOMAXCONN	2222	---
The TCP maximum receive buffer size is the maximum value an application can set as its receive buffer size using SETSOCKOPT().	N/A	TCPCONFIG TCPMAXRCVBUFRSIZE	577	333
The TCP receive buffer size.	N/A	TCPCONFIG TCPRCVBUFRSIZE	Default	---
The maximum send buffer size.	N/A	TCPCONFIG TCPMAXSENDBUFRSIZE	Default	---
The TCP send buffer size.	N/A	TCPCONFIG TCPSENDBFRSIZE	Default	---
The default TCP keepalive interval for applications that enable the SO_KEEPALIVE socket option and do not override the interval using the TCP_KEEPALIVE socket option.	N/A	TCPCONFIG INTERVAL	Default	---
The interval in seconds between keepalive probes.	N/A	TCPCONFIG KEEPALIVEPROBEINTERVAL	Default	---
The number of keepalive probes before the connection is aborted.	N/A	TCPCONFIG KEEPALIVEPROBES	Default	---

In this example, a simple scalar parameter was changed. View details is very sophisticated and shows you changes made to table parameters, as shown on the next page.

View Details: table parameters



Welcome | Configuration A...

Configuration Assistant (Home) ▸ TCP/IP Profile ▸ Configure Change Set ▸ View Details — Help

View Details for Changeset CS1 for PLEX1.LPAR1.STACK1

Ignore hop limits in IPv6 router advertisements that override the defined hop limit	N/A	IPCONFIG6 IGNOREROUTERHOPLIMIT	Default	---
Ignore ICMP redirects for IPv4 that cause a route update	N/A	IPCONFIG IGNOREREDIRECT	Default	---
Ignore ICMP redirects for IPv6 that cause a route update	N/A	IPCONFIG6 IGNOREREDIRECT	Default	---

Summary of Changed Static Routes

	Destination/Subnet	First Hop	Interface	MTU	Description
Routes Changed					
Change set value	DEFAULT	2.2.2.254	OSA1	DEFAULTSIZE	---
Base value if different	---	5.5.5.253	---	---	---
New Routes Added					
Change set value	10.1.0.0/32	2.2.2.254	OSA1	DEFAULTSIZE	new route

Ports: Reserve ports for application workloads

Global Port Properties

Configuration Assistant Description	Detailed Description	Statement Parameter	Change set value	Base value, if different
Restrict low ports (1-1023) from use unless authorized for TCP	N/A	TCPCONFIG RESTRICTLOWPORTS	Default	---
Restrict low ports (1-1023) from use unless authorized for UDP	N/A	UDPCONFIG RESTRICTLOWPORTS	Default	---

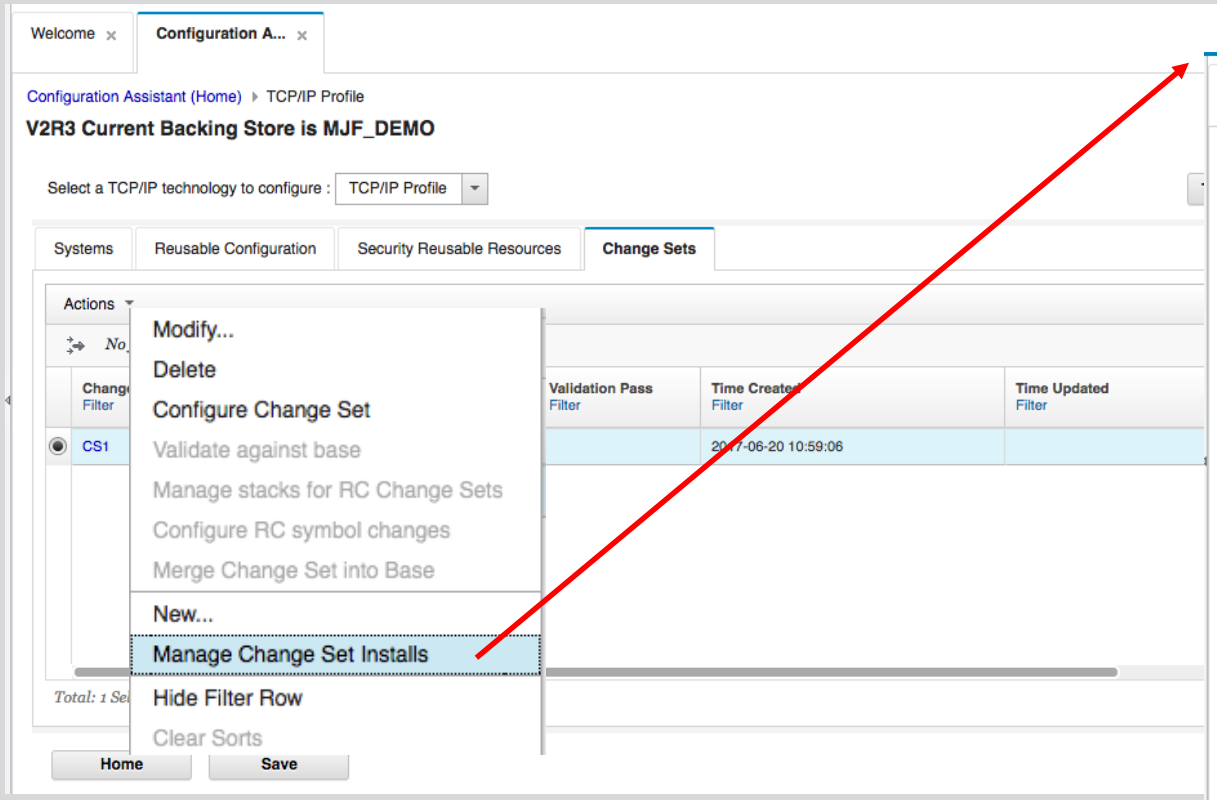
Close | Back to Top

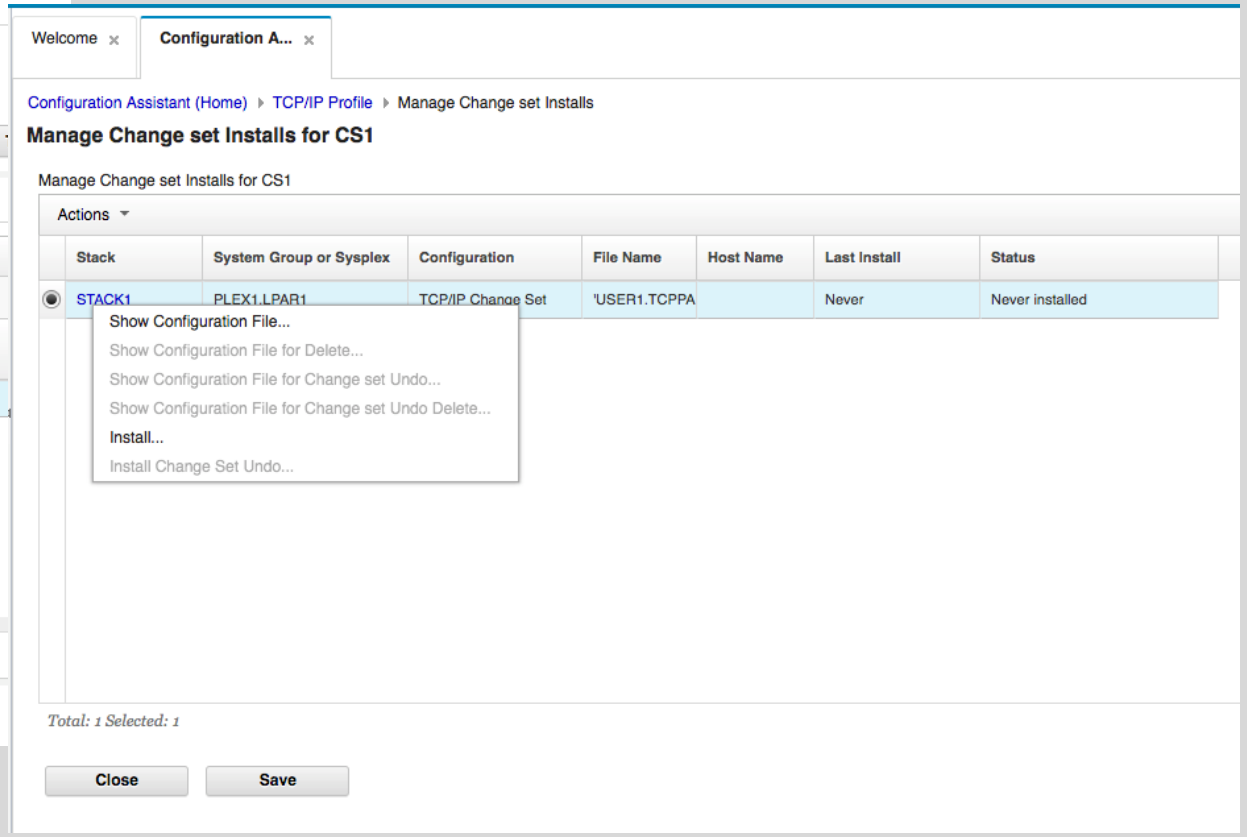
In this example, the static route table was modified by:

- Changing the first hop of the default route
- Adding a new route to 10.1.0.0/32.

View Details helps you see before and after

Installing changes: creating the OBEY file

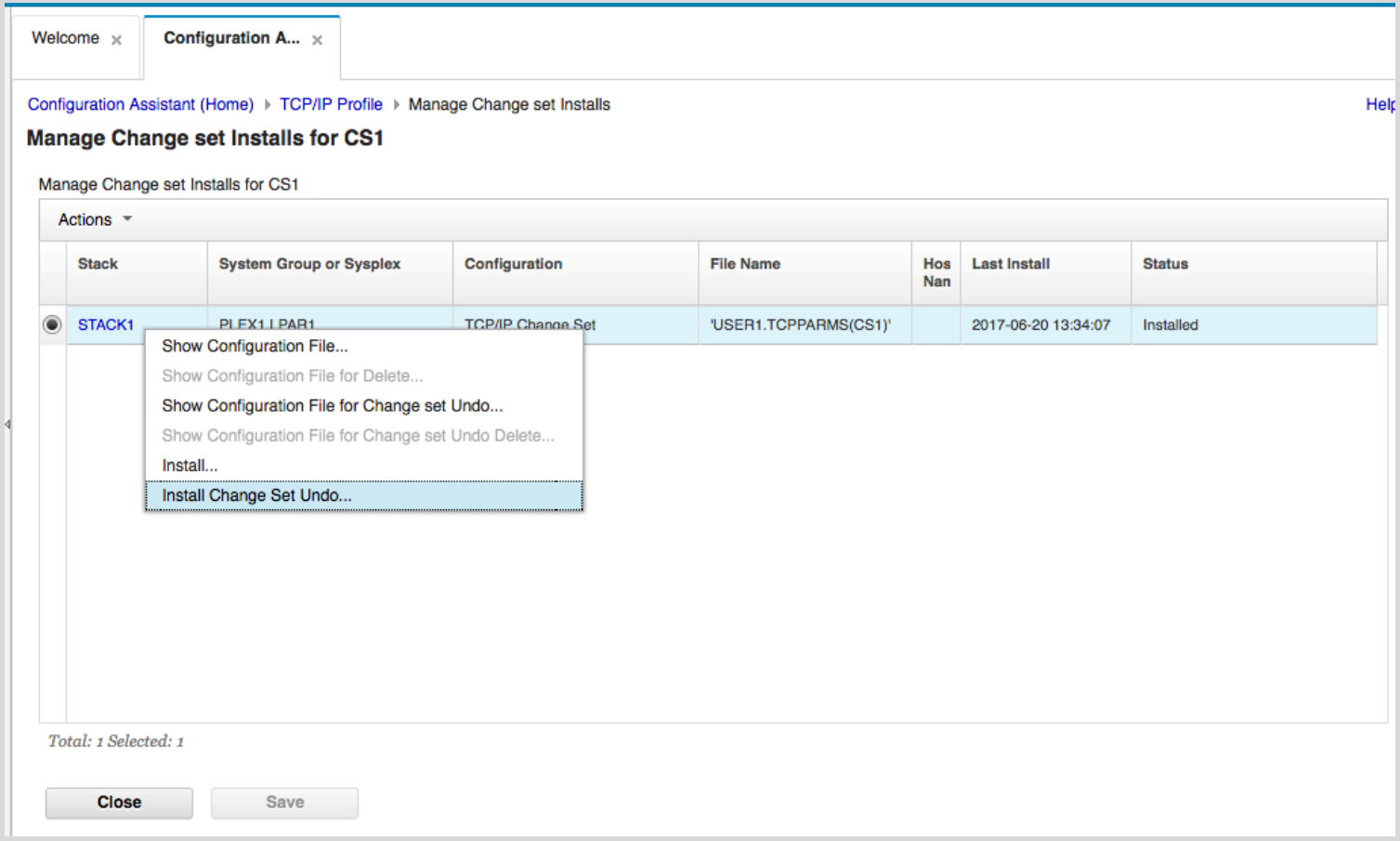




The OBEY file is created and stored through the Install interface. It works similarly to the Install interface for regular configuration files

Once the OBEY file has been installed, the operator can run the VARY OBEY console command to put it into effect

Change set UNDO

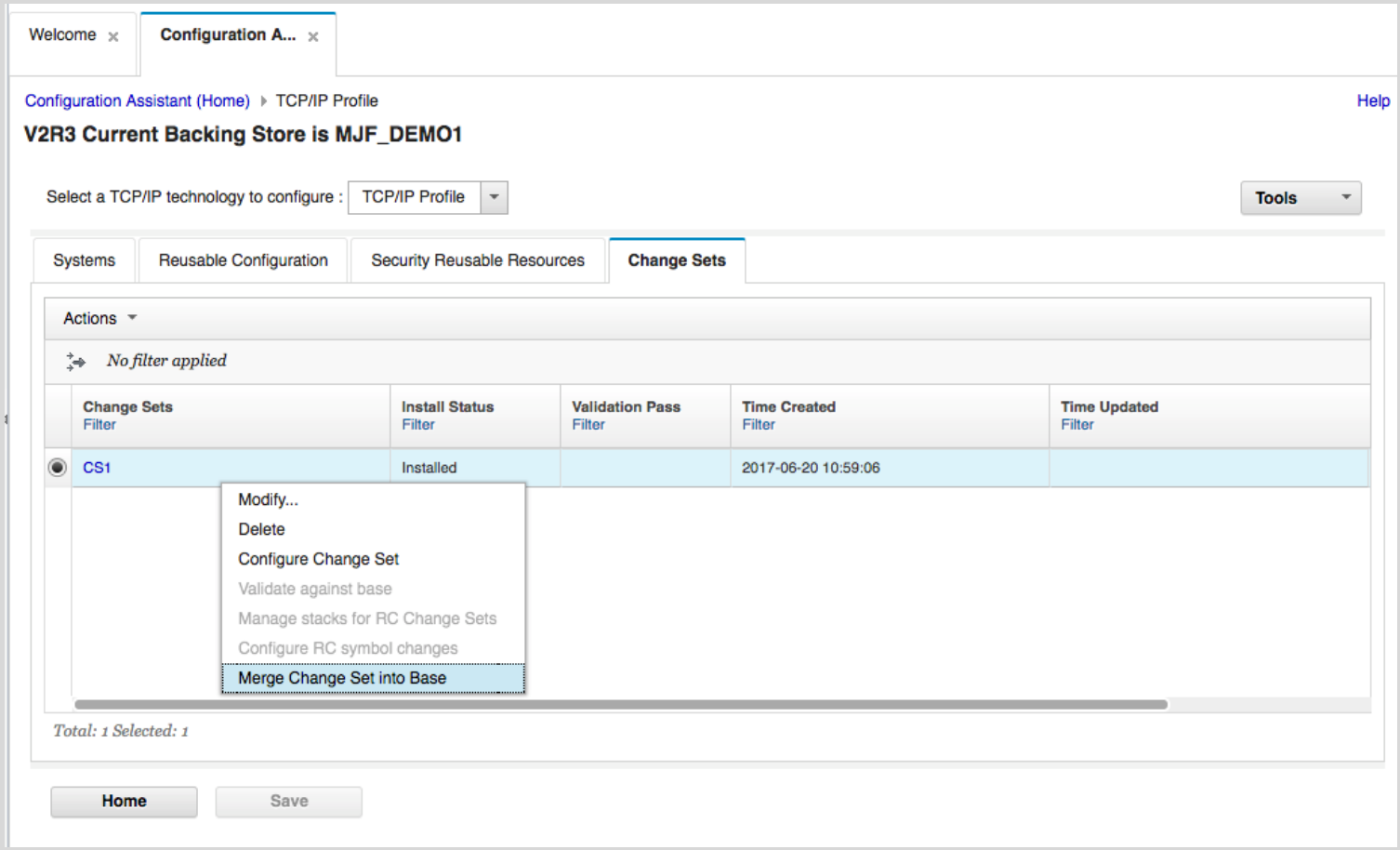


Useful for undoing erroneous change sets, or to remove changes that were meant to be temporary

Change set Undo is an install action.

- After a change set has been installed, you can undo it for a stack by selecting **Actions->Install Change Set Undo** on the Manage Installs panel for change sets.
- This creates and saves an OBEY file that restores the stack's configuration to the pre-Change Set state.
- The change set is still available to be edited and/or re-installed from the Network Configuration Assistant.

Change set merge

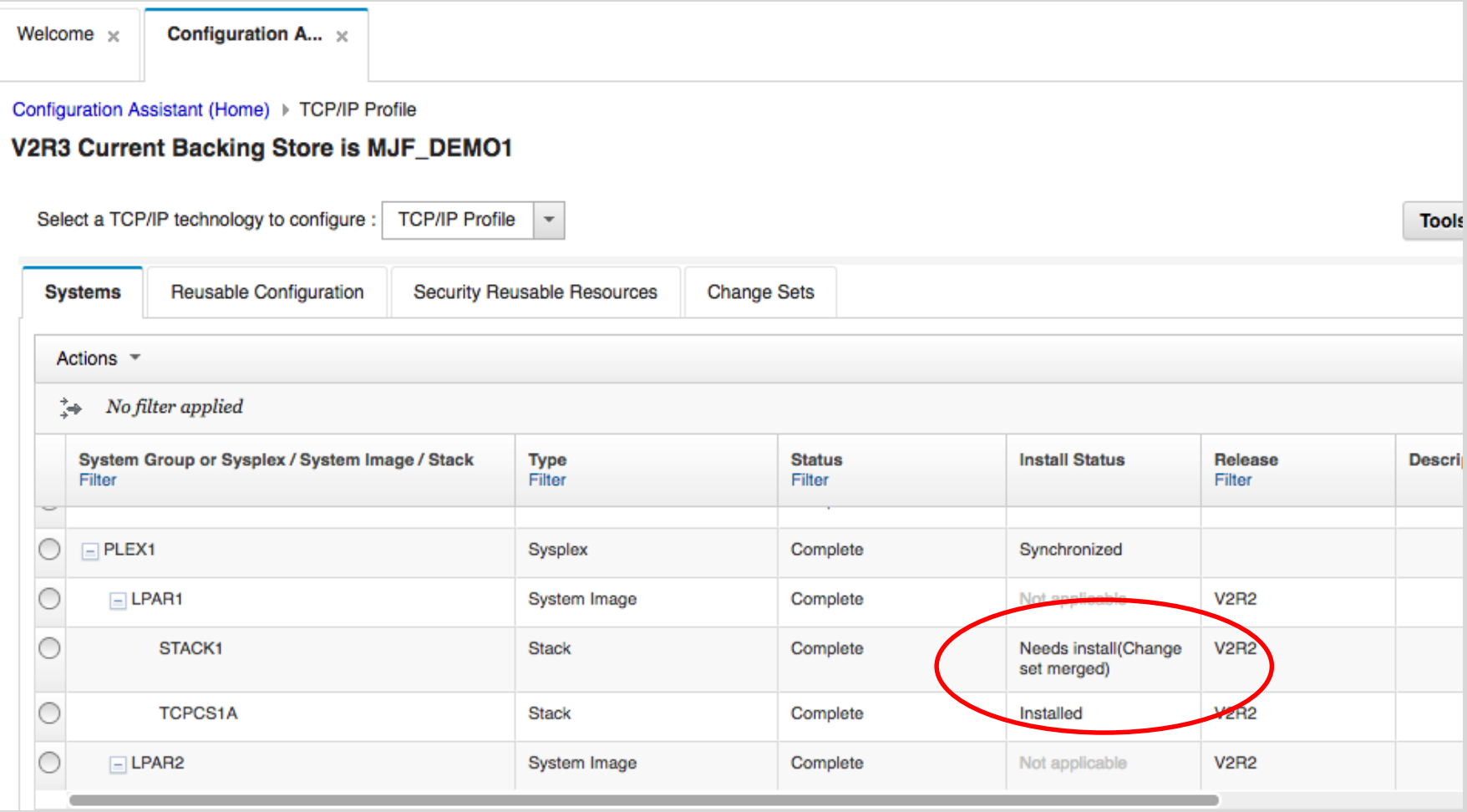


Merge is a change set action

- After a change set has been installed (and has not been undone), merge the changes into the stack by seleting **Actions->Merge Change Set into Base**
- This updates the base configuration to the changed configuration and removes the stack from the change set.
- If this is the only stack in a change set, the change set is deleted

Useful for making the change a permanent part of the stack's configuration (example: adding a port for a new application)

Change set merge notes



Merging a change set into the base configuration changes the base configuration

- This has all the same implications as if the base configuration had been edited manually.
- The base configuration must be re-installed so that it is available to the stack next time it IPLs
- Because the stack needs to be installed, a new change set cannot be based on it until that install is done.

Stack change set restrictions

When Network Configuration Assistant is creating an OBEY file for a change set, it creates the OBEY file necessary to change the base configuration to match the change set configuration. For this reason, Network Configuration Assistant must know exactly what is in the base TCP/IP configuration on the MVS image to correctly generate this file.

This requirement results in two main change set restrictions:

1. A change set can only be based on installed configuration.
    - For a stack change set, this means that stacks whose install status is Needs Install or Never Installed are not eligible to have change sets based on them. .
2. Configuration with a change set based on it cannot be edited.
    - For a stack change set, this means that a stack that has a change set based on it cannot be edited in the GUI until the change set is either merged or deleted.

Change set special case: changing IP interfaces

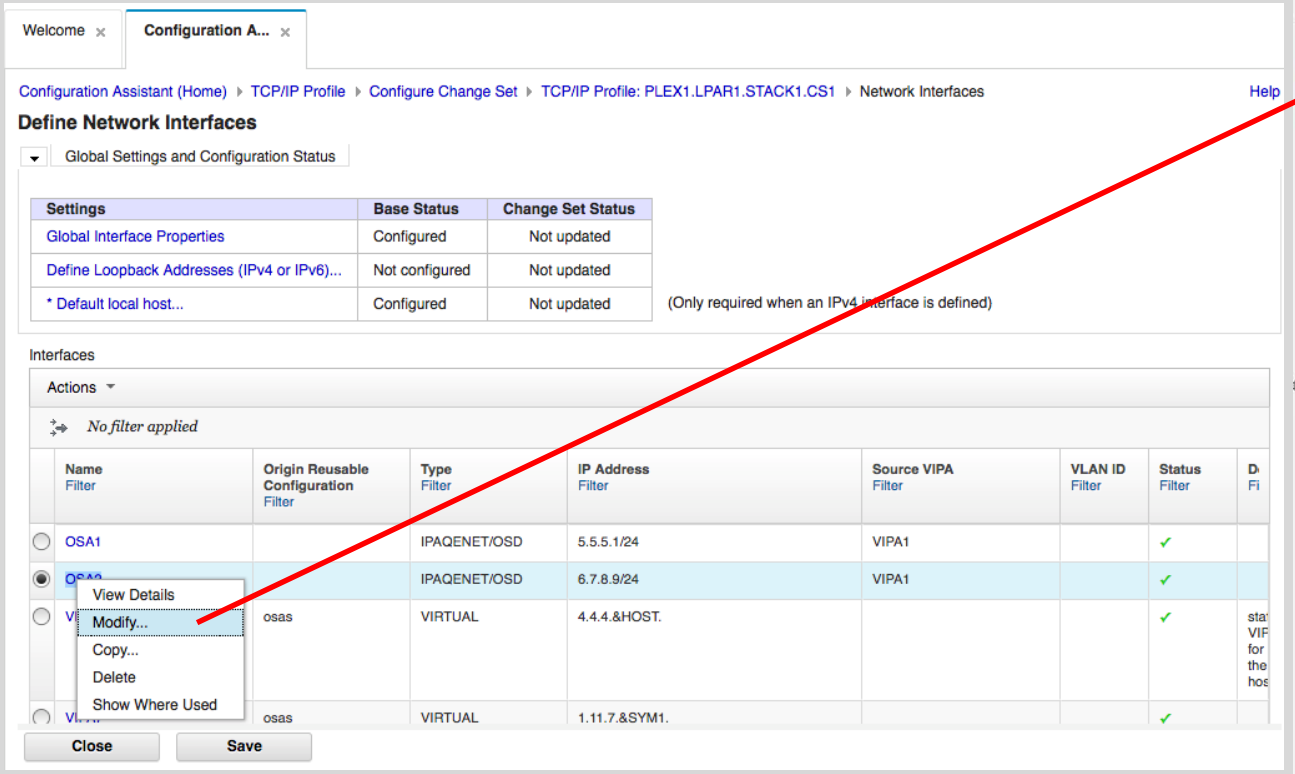
The procedure for changing the name, IP address, or most other characteristics of an IP interface for Communications Server is:

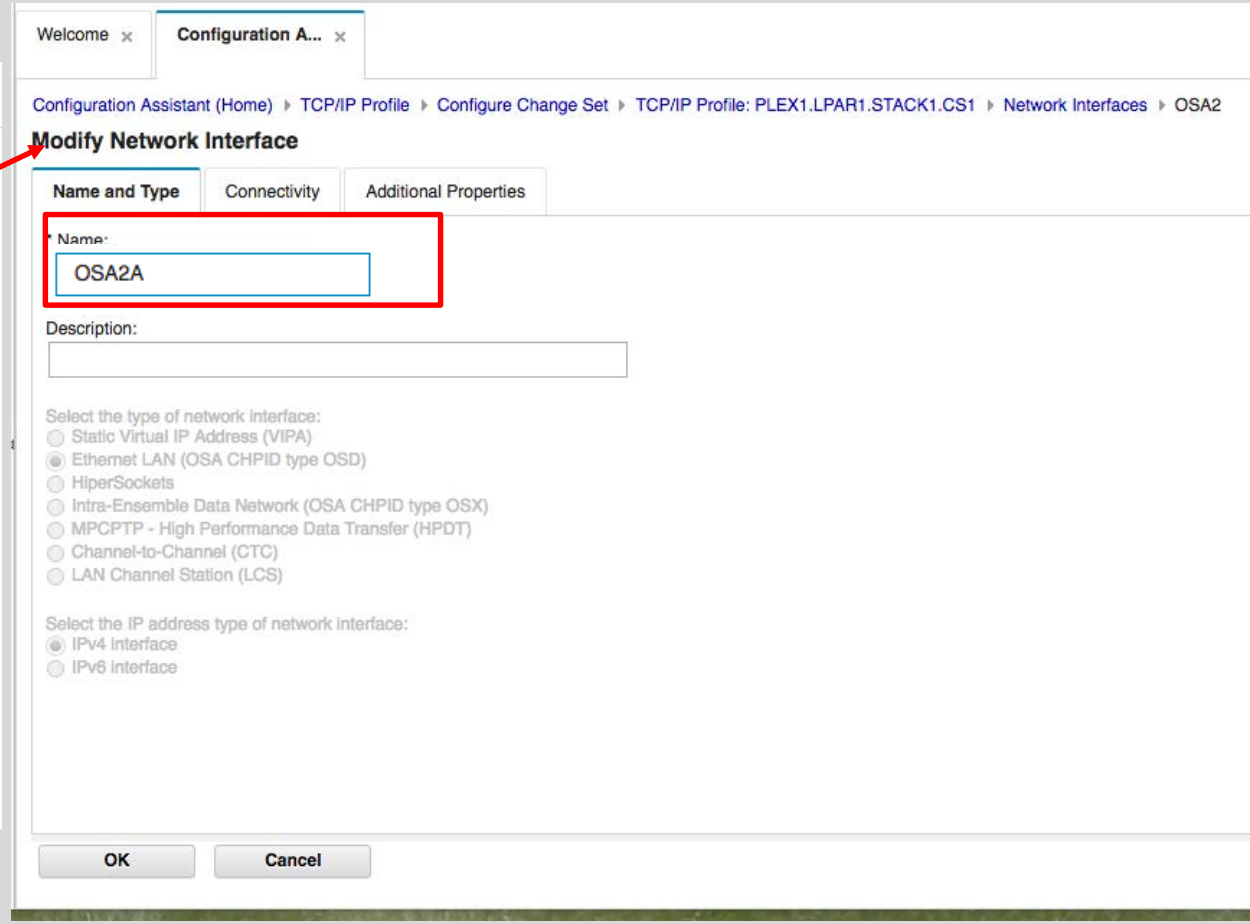
1. Stop the interface to be changed
2. Perform a VARY OBEY to delete the interface to be changed
3. Perform a VARY OBEY to add the interface with its new characteristics.
   Restriction: this must be a different OBEY file from the one used in step 2
   - You cannot delete and add an interface in the same OBEY file!

Because of this requirement, Network Configuration Assistant has special processing for these types of interface changes.

Network Configuration Assistant creates two OBEY files: A DELETE file to delete the old definition, and then another OBEY file to add it back with changes. The next few pages illustrate this process.

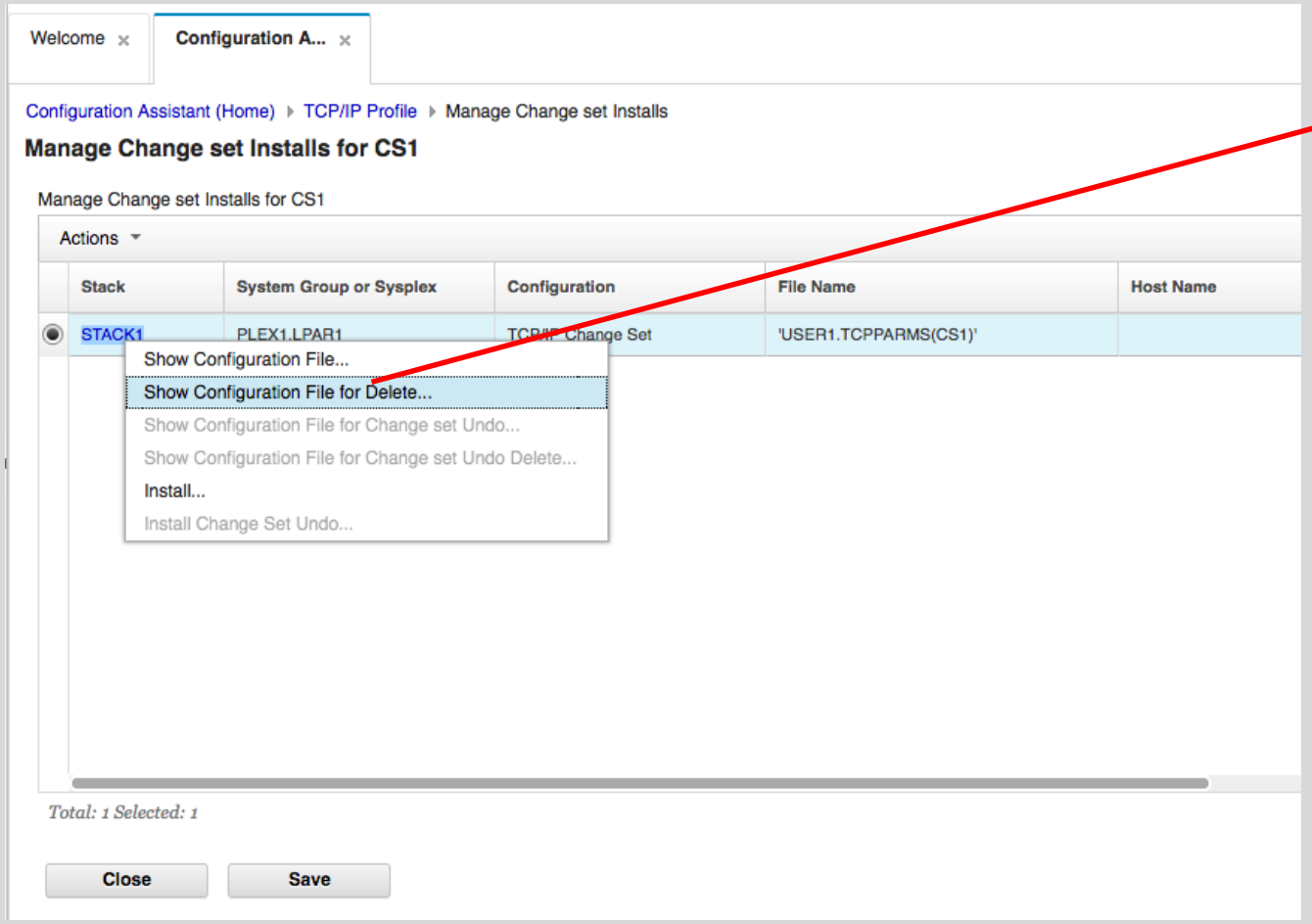
Change set example – change interface name

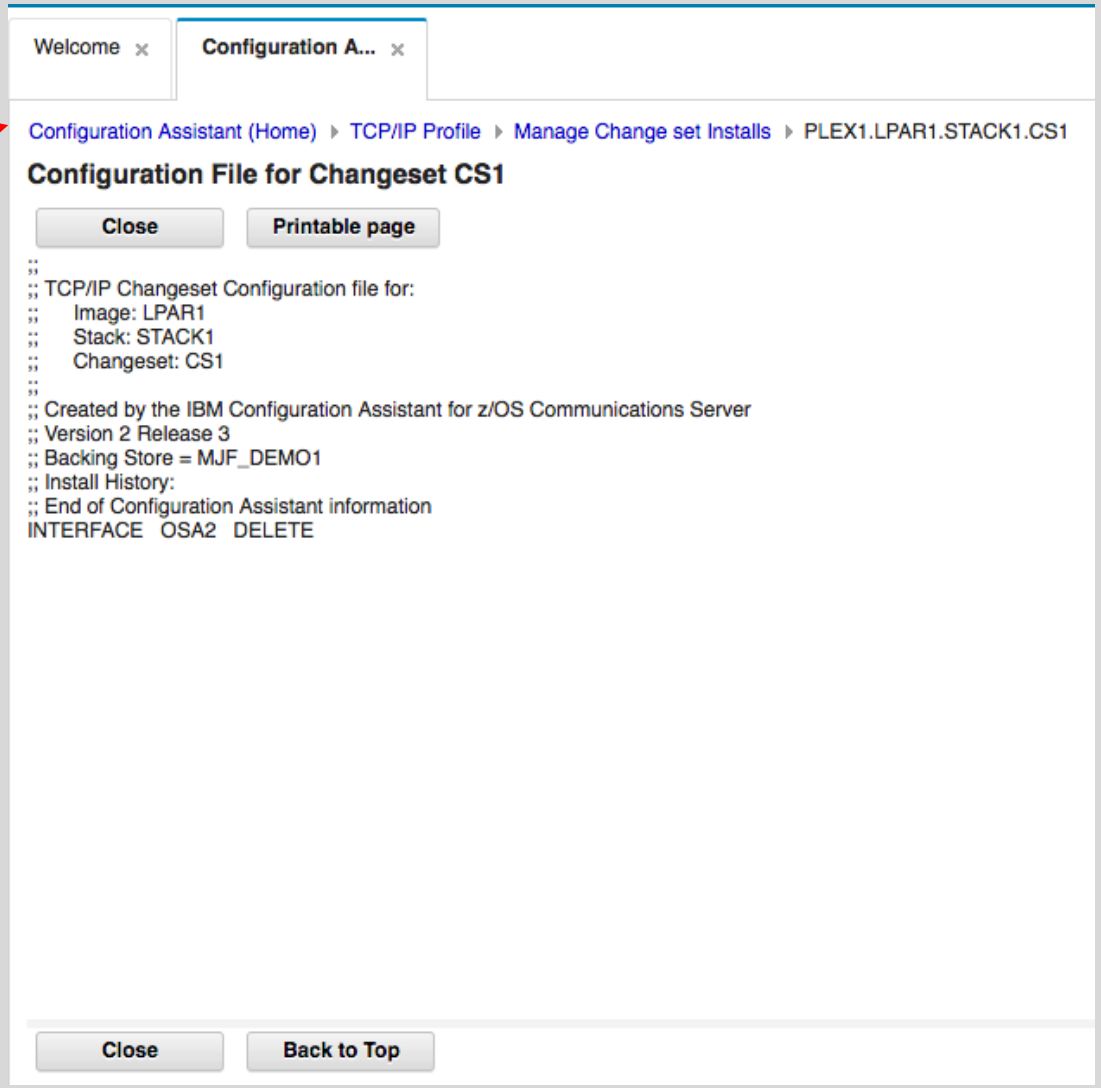




In this example, the name of interface “OSA2” is changed to “OSA2A”

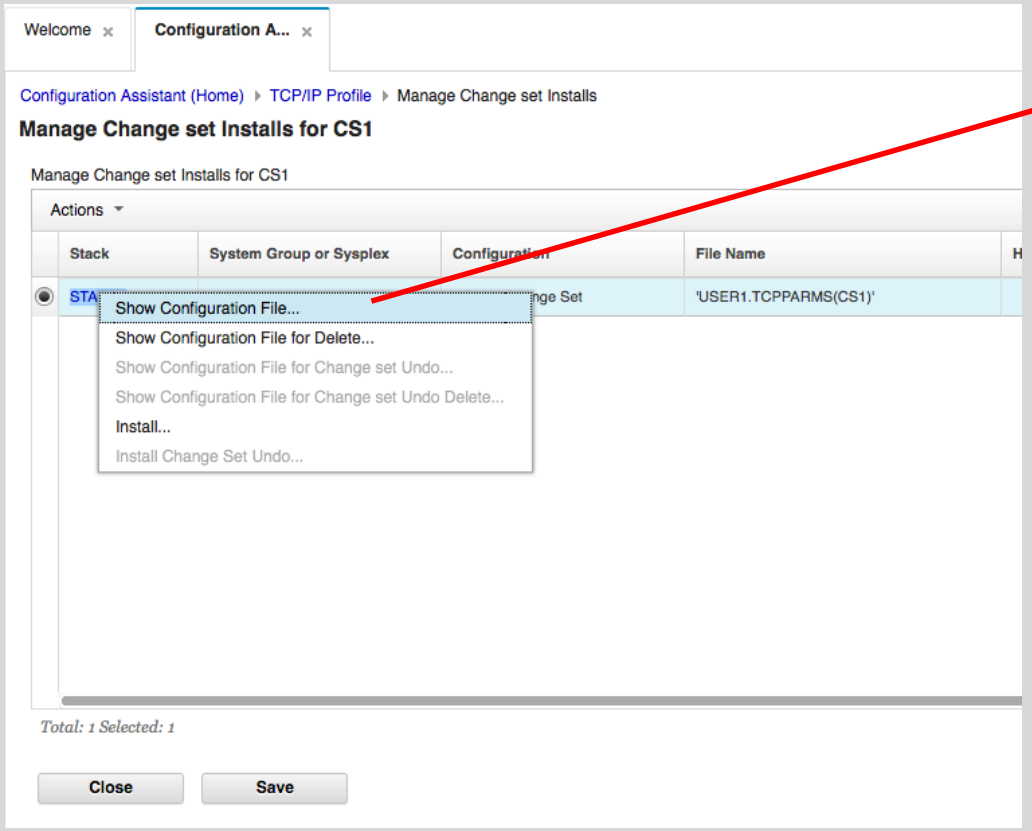
Change interface name, delete file

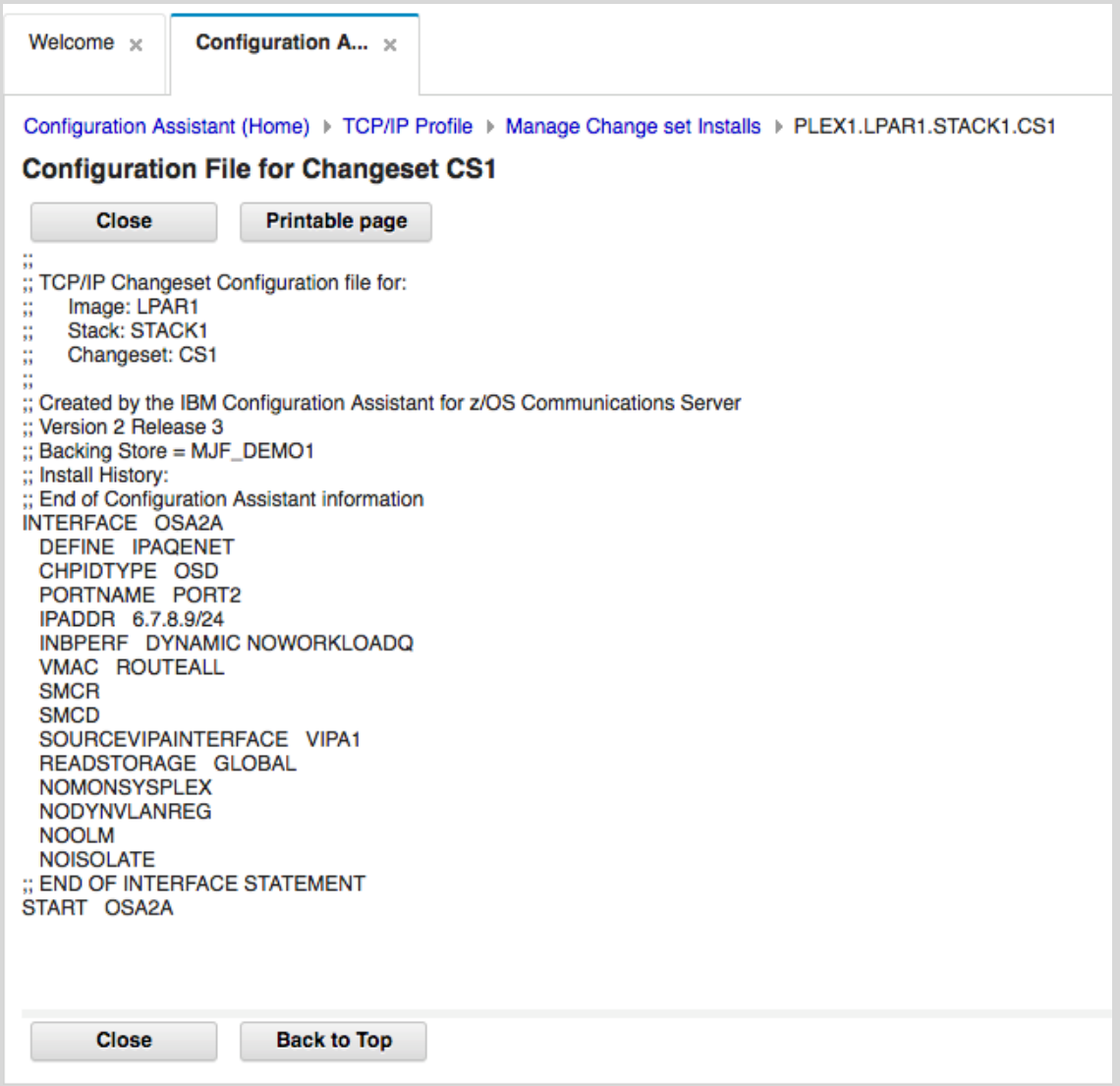




Because the interface's name was changed, a separate DELETE file is generated alongside the normal OBEY file

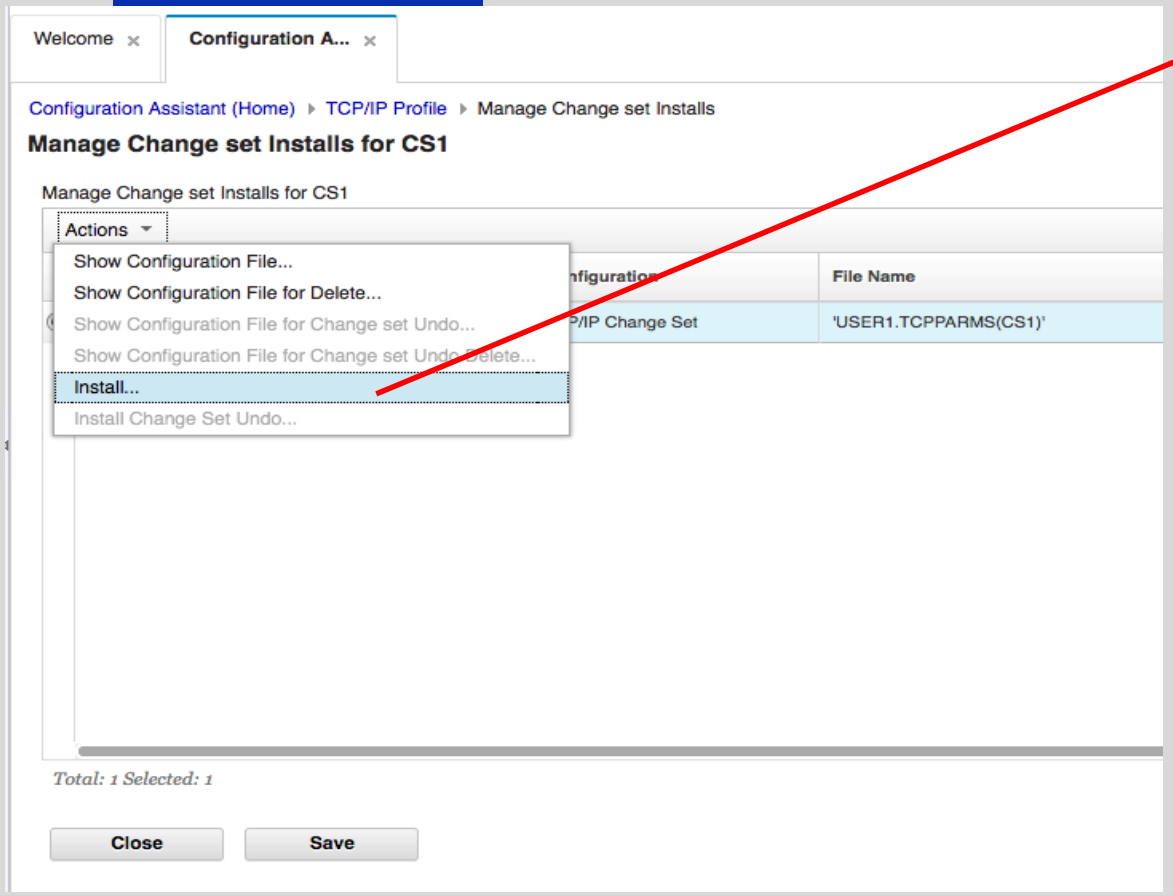
Change interface name, continued

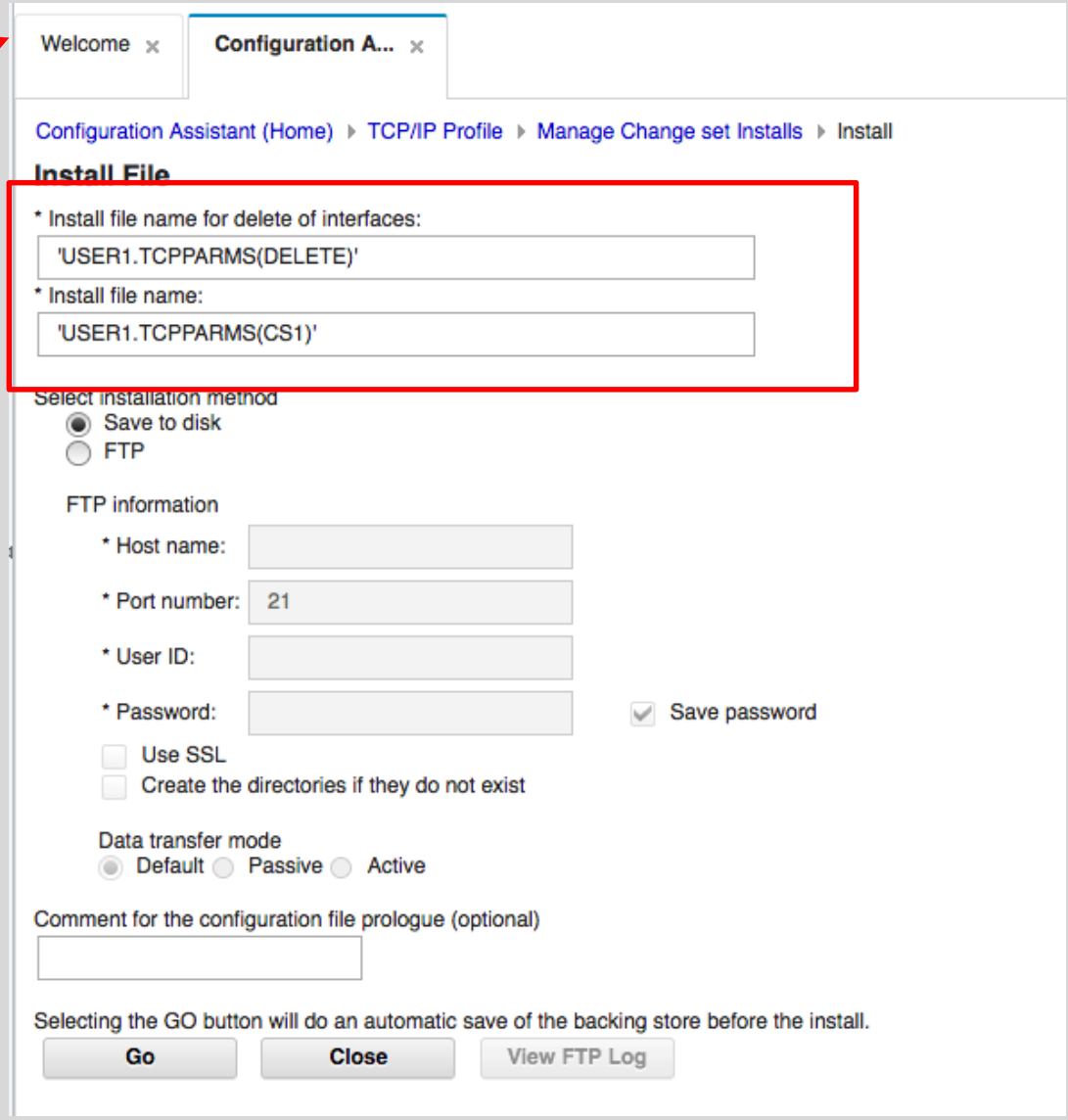




The obey file adding the interface back with the new name is created alongside the DELETE file

Install interface name change files

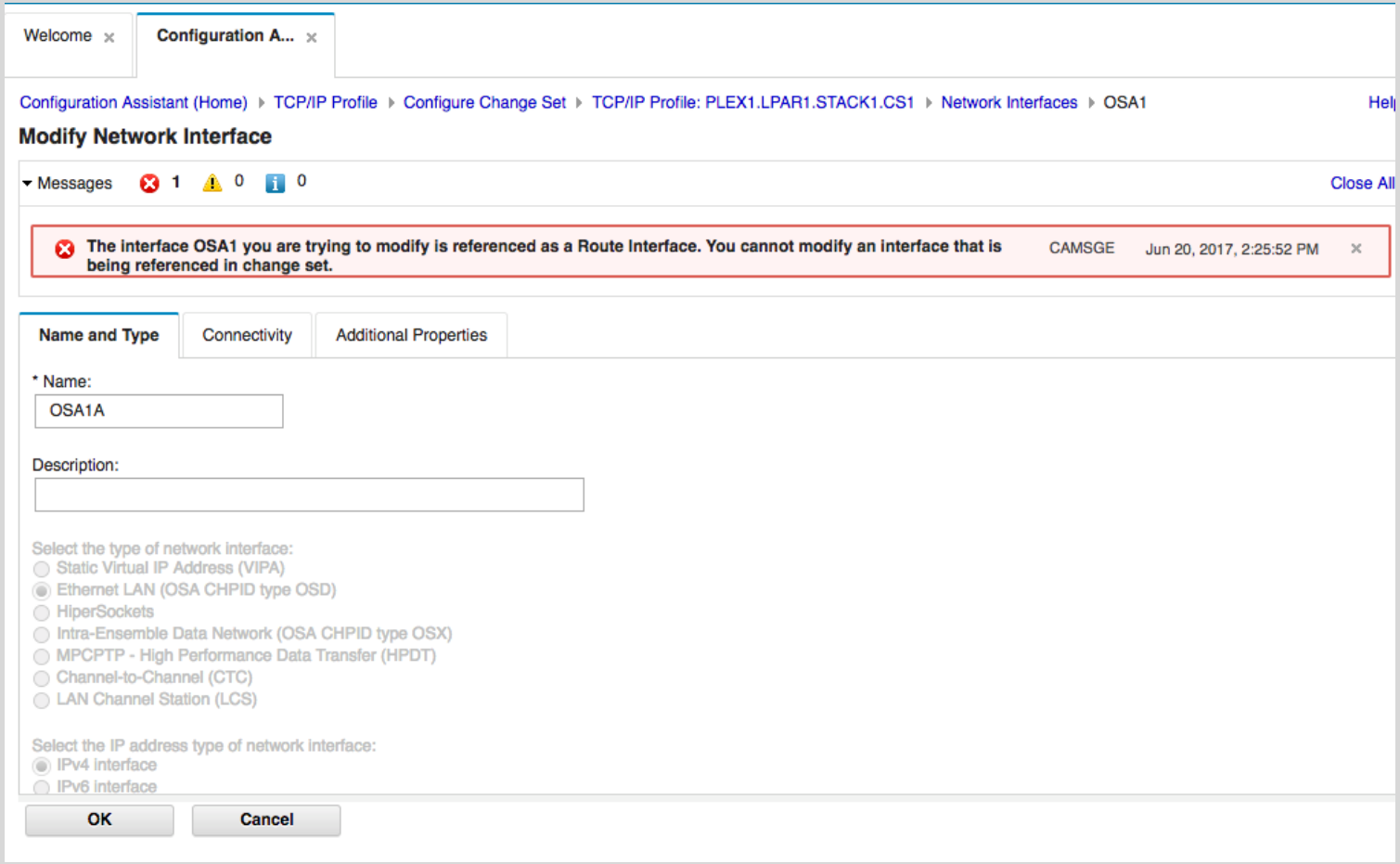




Both the delete and the add with new name OBEY files are saved when this change set is installed. As always, you can edit the name of either one.

- Note that the UNDO for this change set will also create both a DELETE and a re-add OBEY file!

Other IP interface change set restrictions



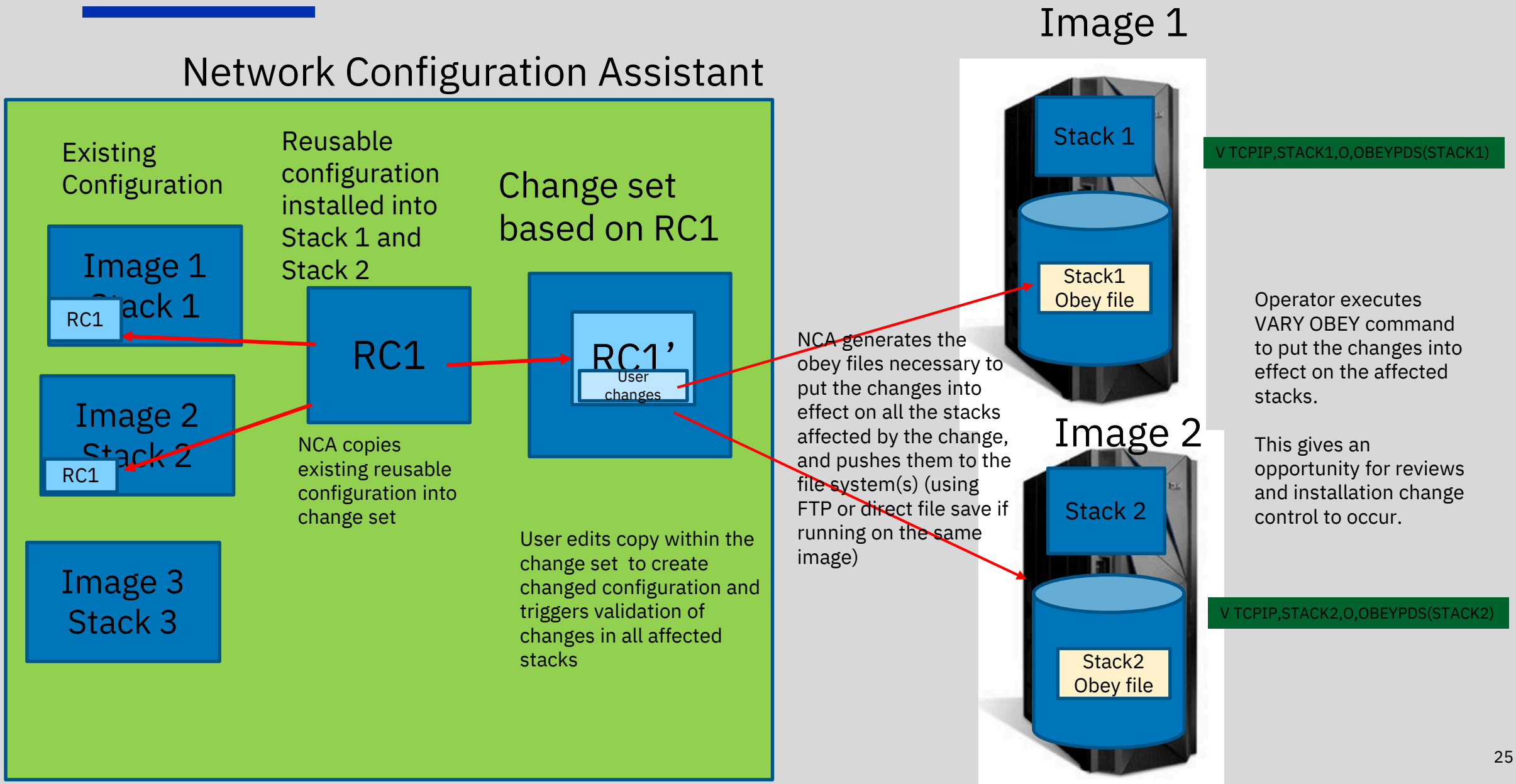
Because an IP interface must be deleted to change it, you cannot change an interface that is referenced elsewhere unless you also delete that reference. This is the same restriction you have when editing interfaces in base configuration in Network Configuration Assistant.

Examples of places were IP interfaces can be referenced:

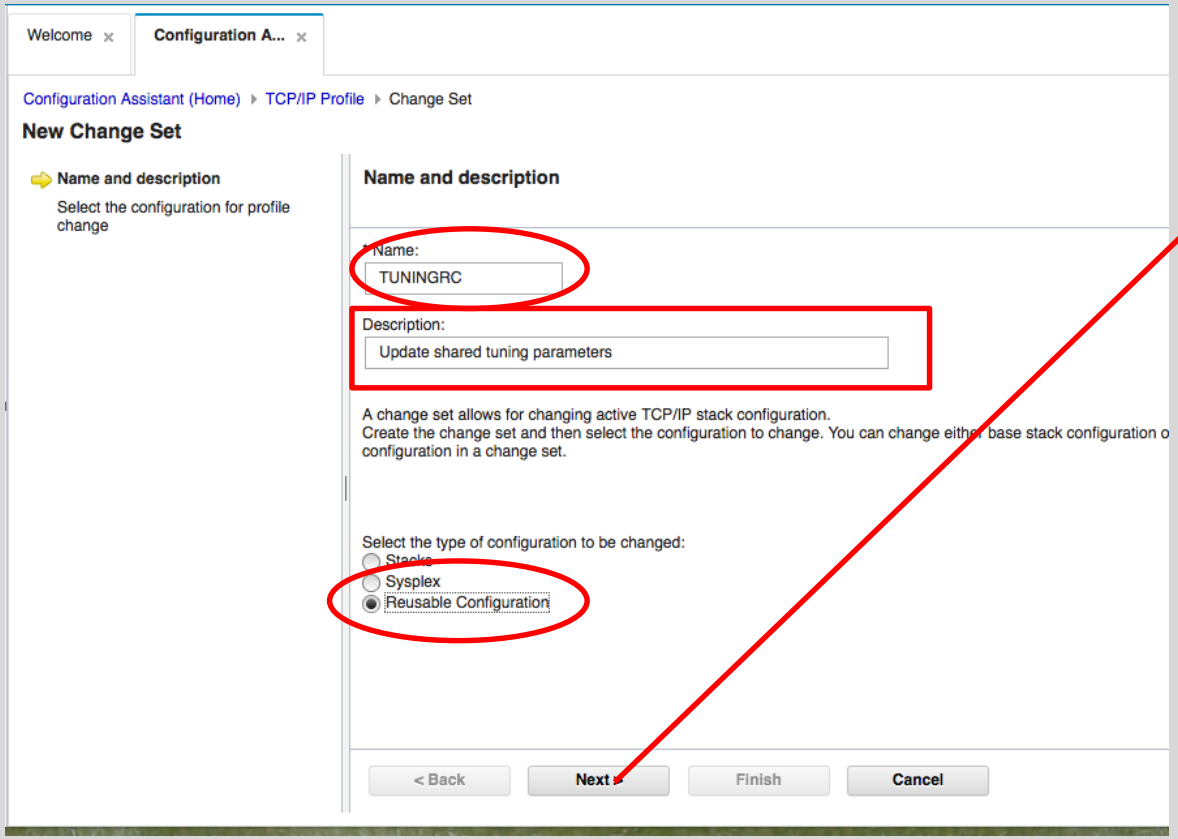
- SOURCEVIPA statements or parameters
- Static route outgoing interface
- Primary interface for a stack
- VIPAROUTE targets

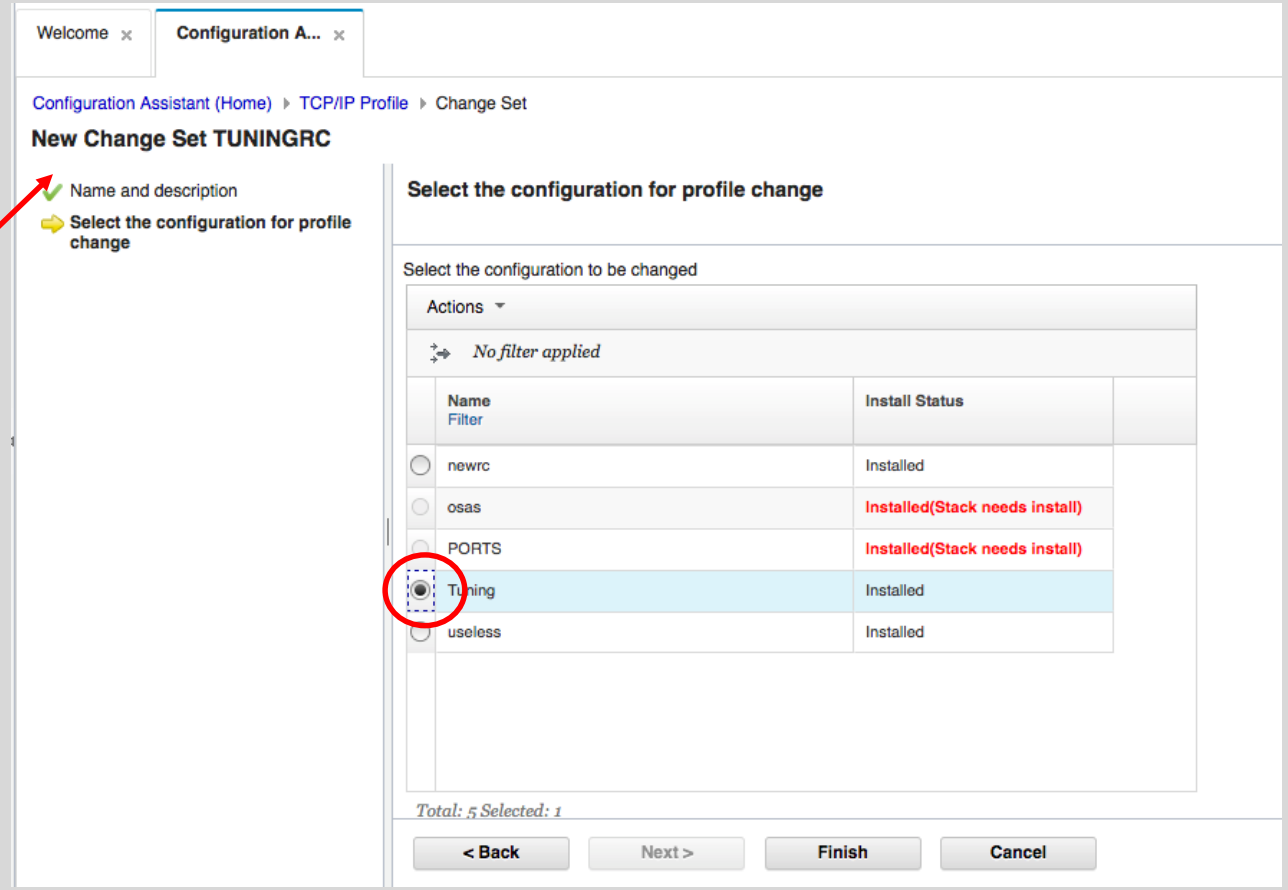
If you attempt to change an interface that is referenced elsewhere, Network Configuration Assistant will tell you where those references are, as shown here.

Illustration: Change sets based on Reusable Configuration



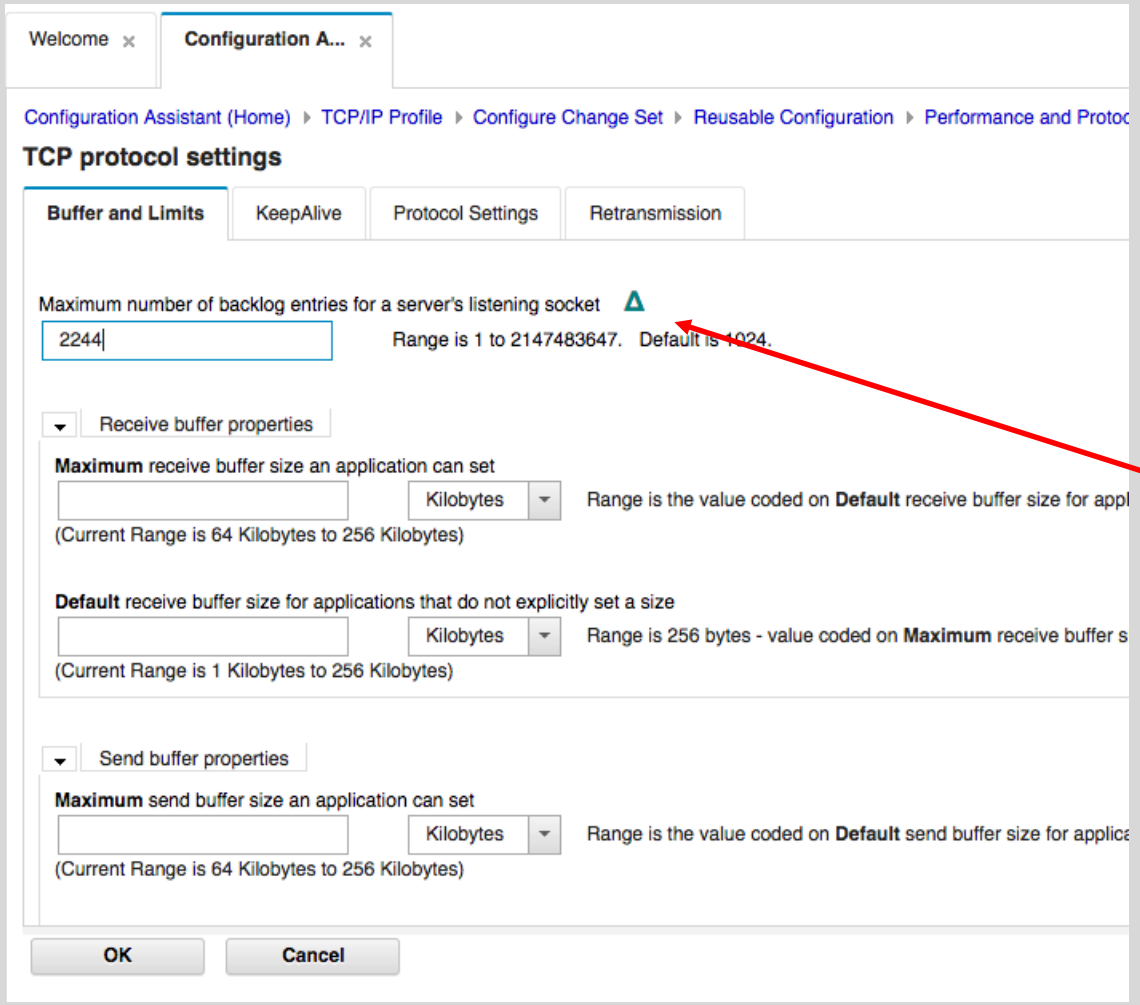
Create a Reusable Configuration Change set





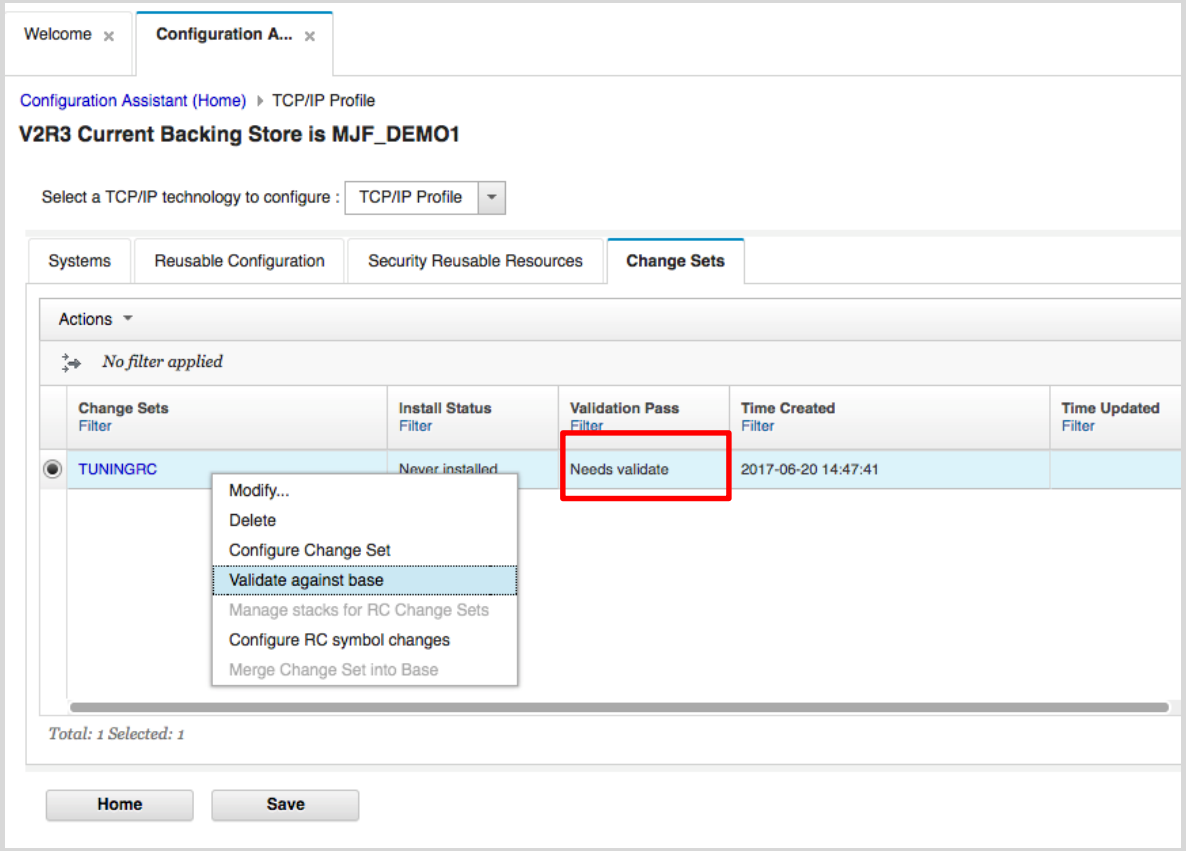
A change set can only be based on a reusable configuration if that RC has been installed into the stacks that use it, AND all those stacks are installed.

Configuring a reusable configuration change set



You configure a reusable configuration change set similarly to how you configure a stack change set. You simply make the desired changes in the editor as if you were editing the Reusable configuration normally. In this example we've updated the backlog limit.

Extra step for RC change sets: validate against base

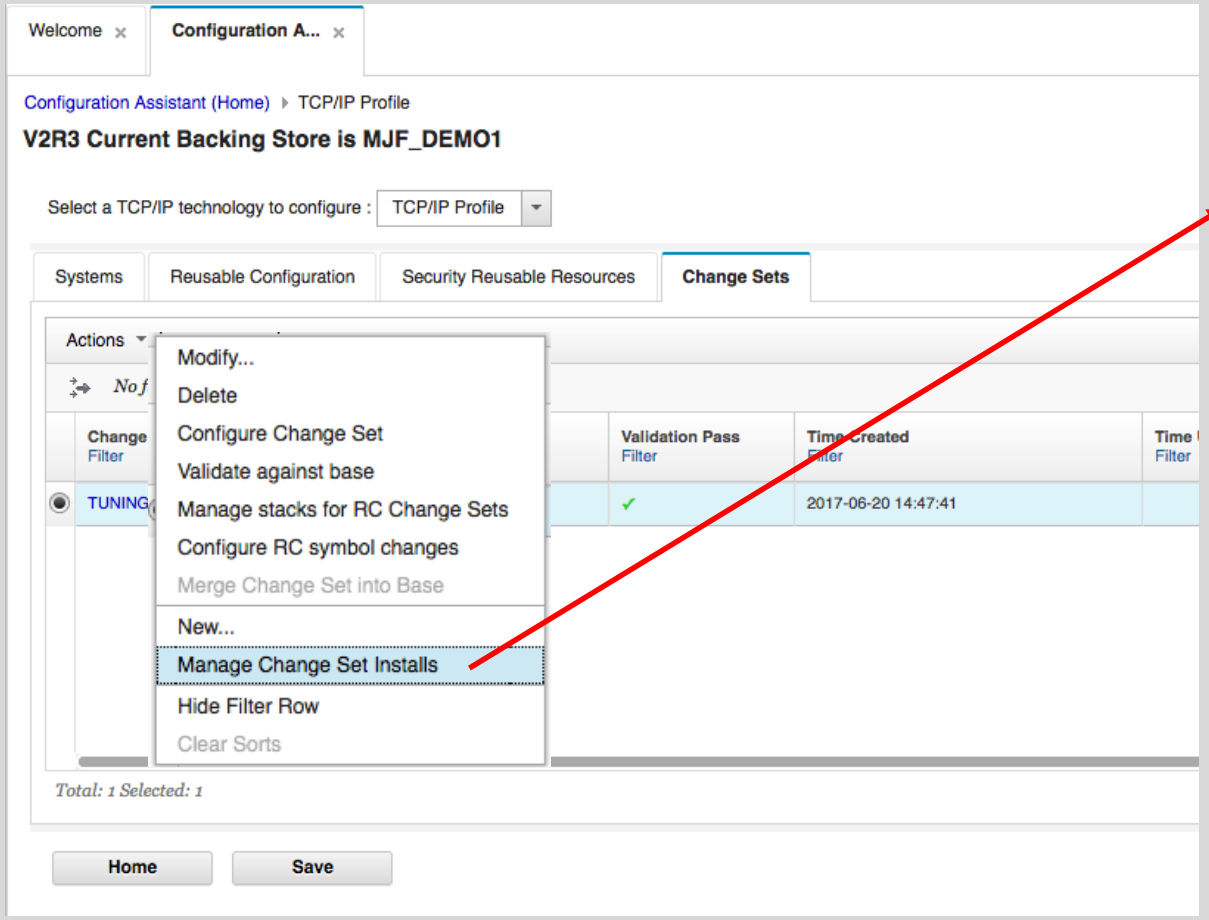


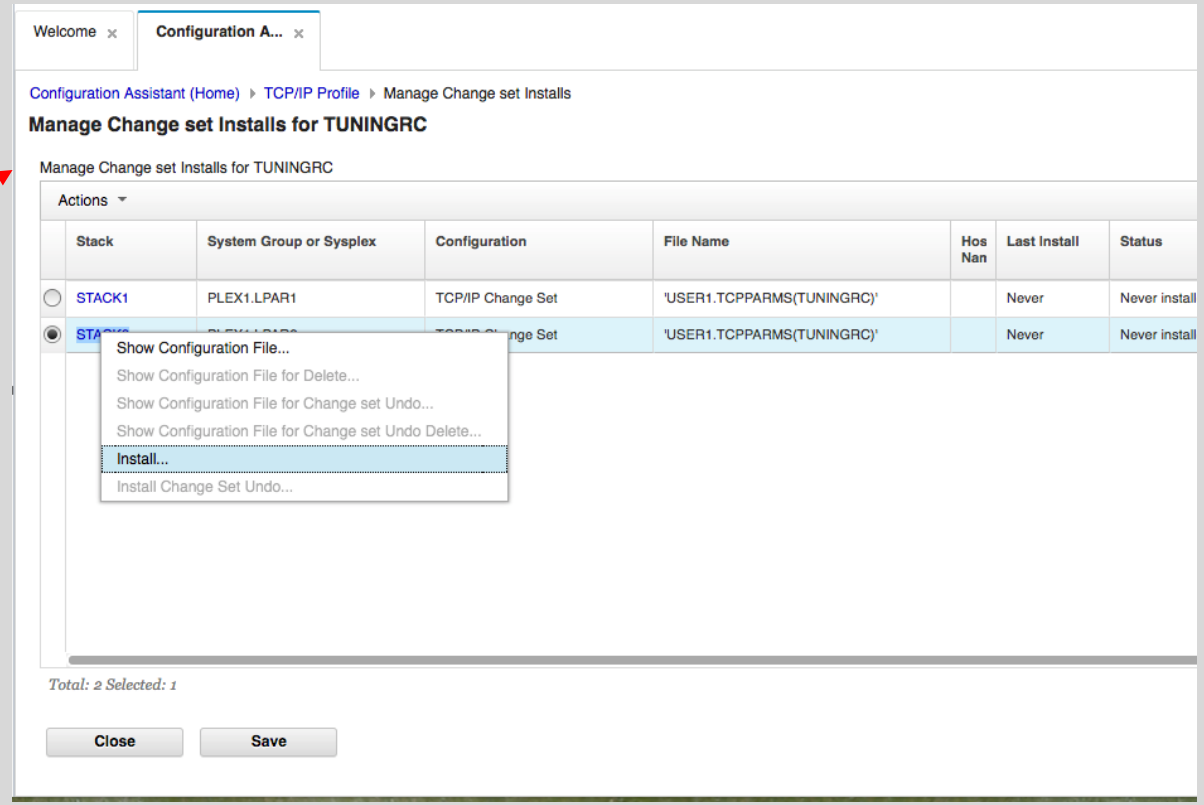
Before a reusable configuration change set can be installed, you must validate it against the base.

This validation verifies that no conflicts or errors were created within the stacks that include this reusable configuration

- For example, adding a duplicate interface name or address, or deleting an interface that's referenced in the stack configuration

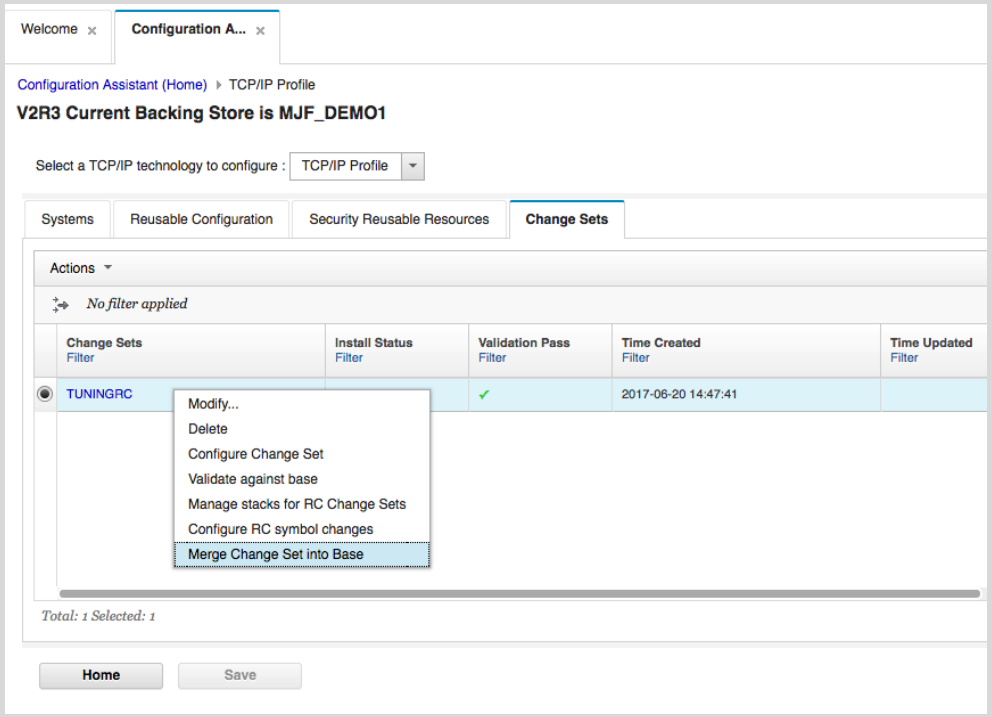
RC change set configuration installation

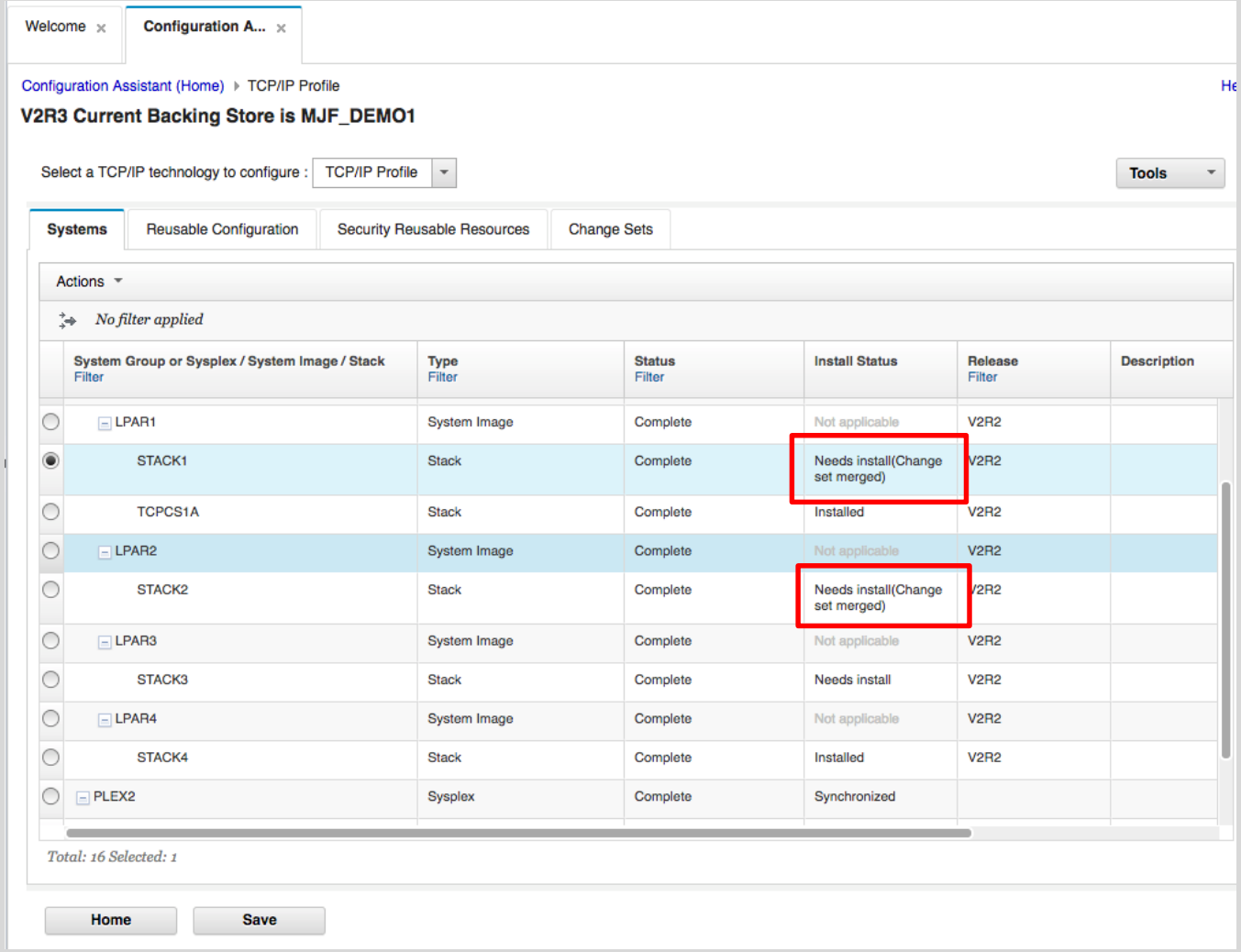




When you install an RC change set, Network Configuration Assistant automatically generates OBEY files for every stack that uses that RC. You can then view, install, and undo the changes on a stack by stack basis.

Merging an RC change set





When you merge an RC change set into its base RC, the RC is updated to match the change set configuration, the changes are pushed to each stack that uses the RC, and then the change set is deleted. Each stack that uses the RC must be reinstalled to make the changed configuration available for the next stack IPL

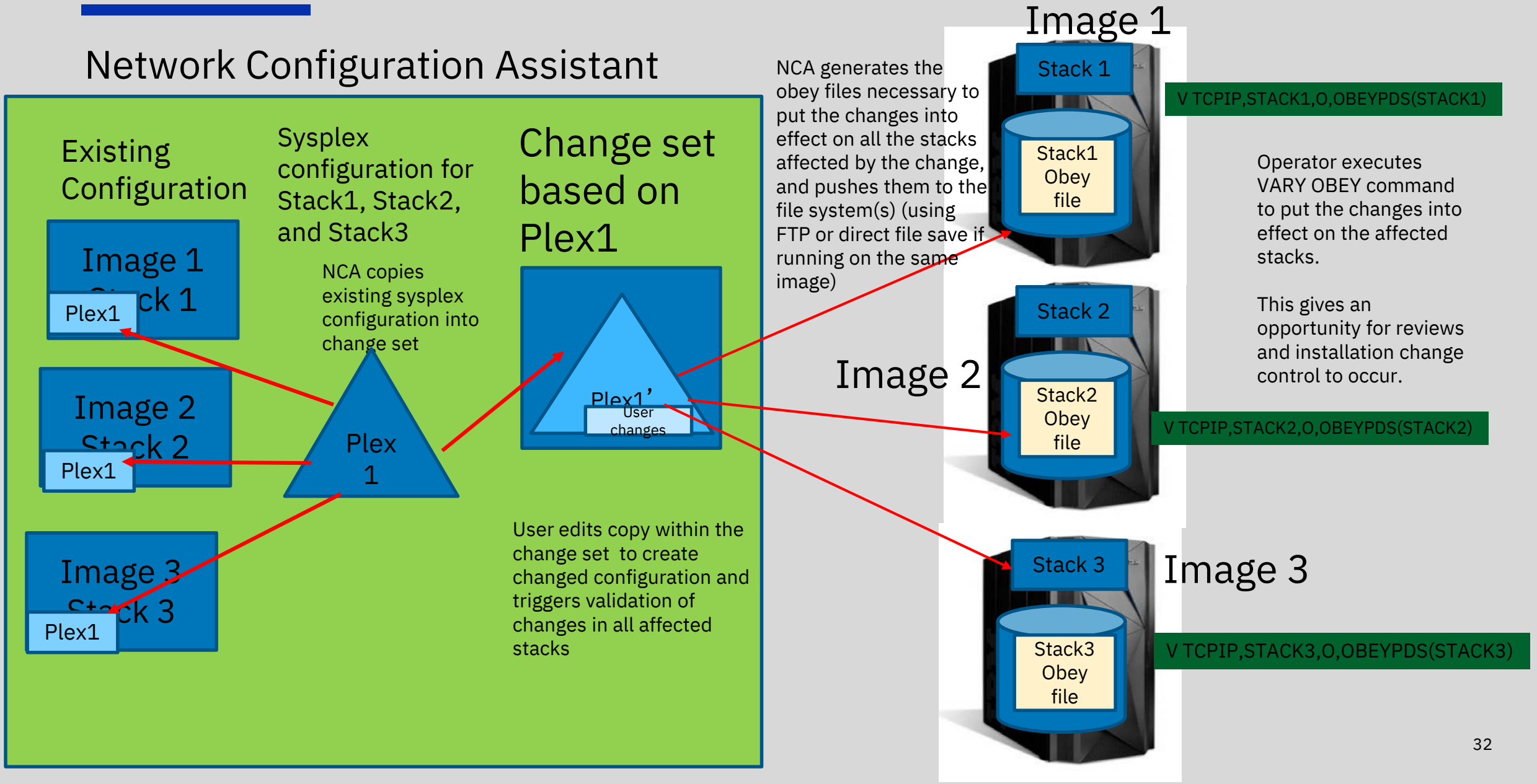
Reusable configuration change set restrictions

Reminder: When Network Configuration Assistant is creating an OBEY file for a change set, it creates the OBEY file necessary to change the base configuration to match the change set configuration. For this reason, Network Configuration Assistant must know exactly what is in the base TCP/IP configuration on the MVS image to correctly generate this file.

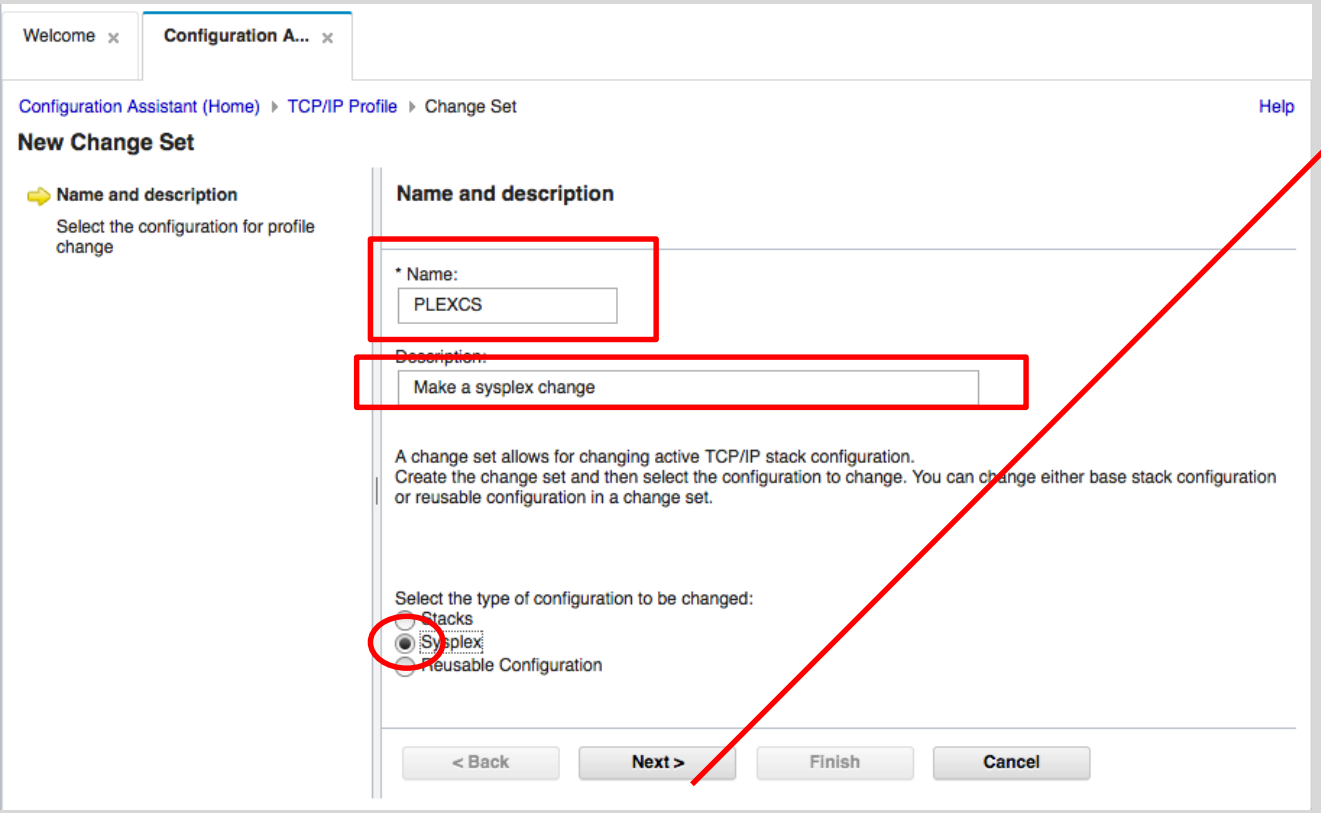
This requirement results in two main change set restrictions:

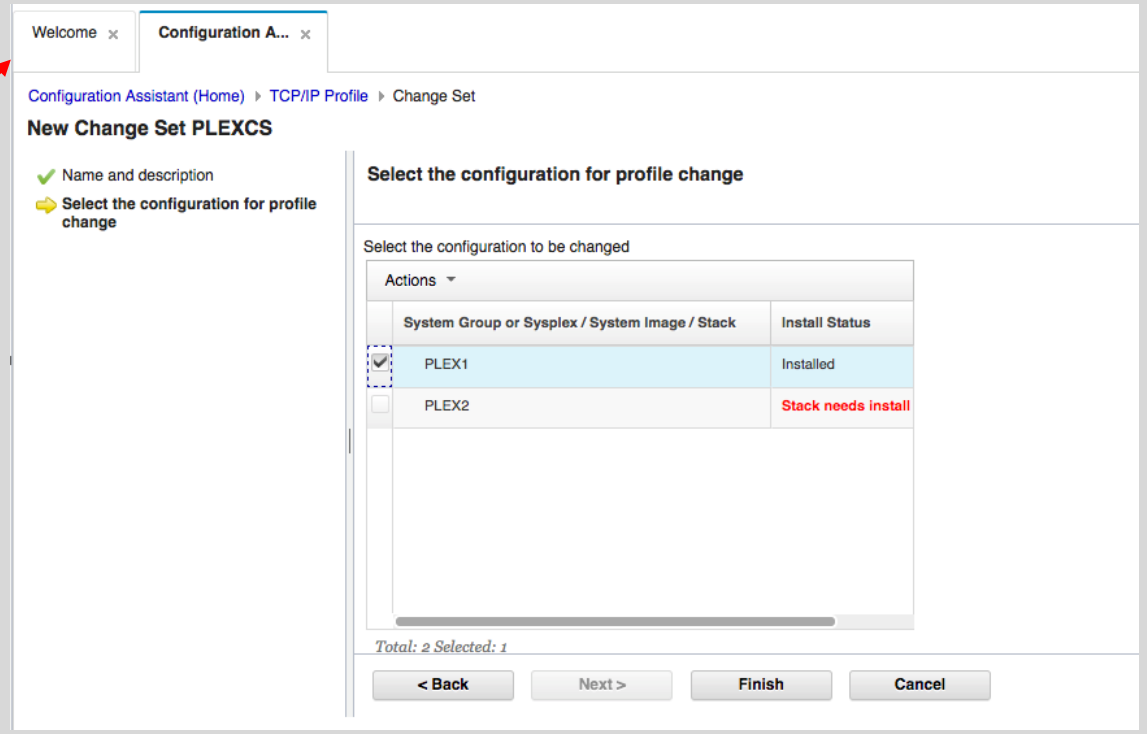
1. A change set can only be based on installed configuration.
    - For a reusable configuration change set, this means that an RC must be installed in all using stacks, and those stacks all have an install status of “Installed” for the RC to be eligible to have a change set based on it.
2. Configuration with a change set based on it cannot be edited.
    - For a reusable configuration change set, this means that an RC with a change set cannot be edited in the Network Configuration Assistant. It also means that none of the stacks that use a reusable configuration that has a change set based on it can be edited. These restrictions are in place until the change set is merged or deleted.

Illustration: Change sets based on a sysplex



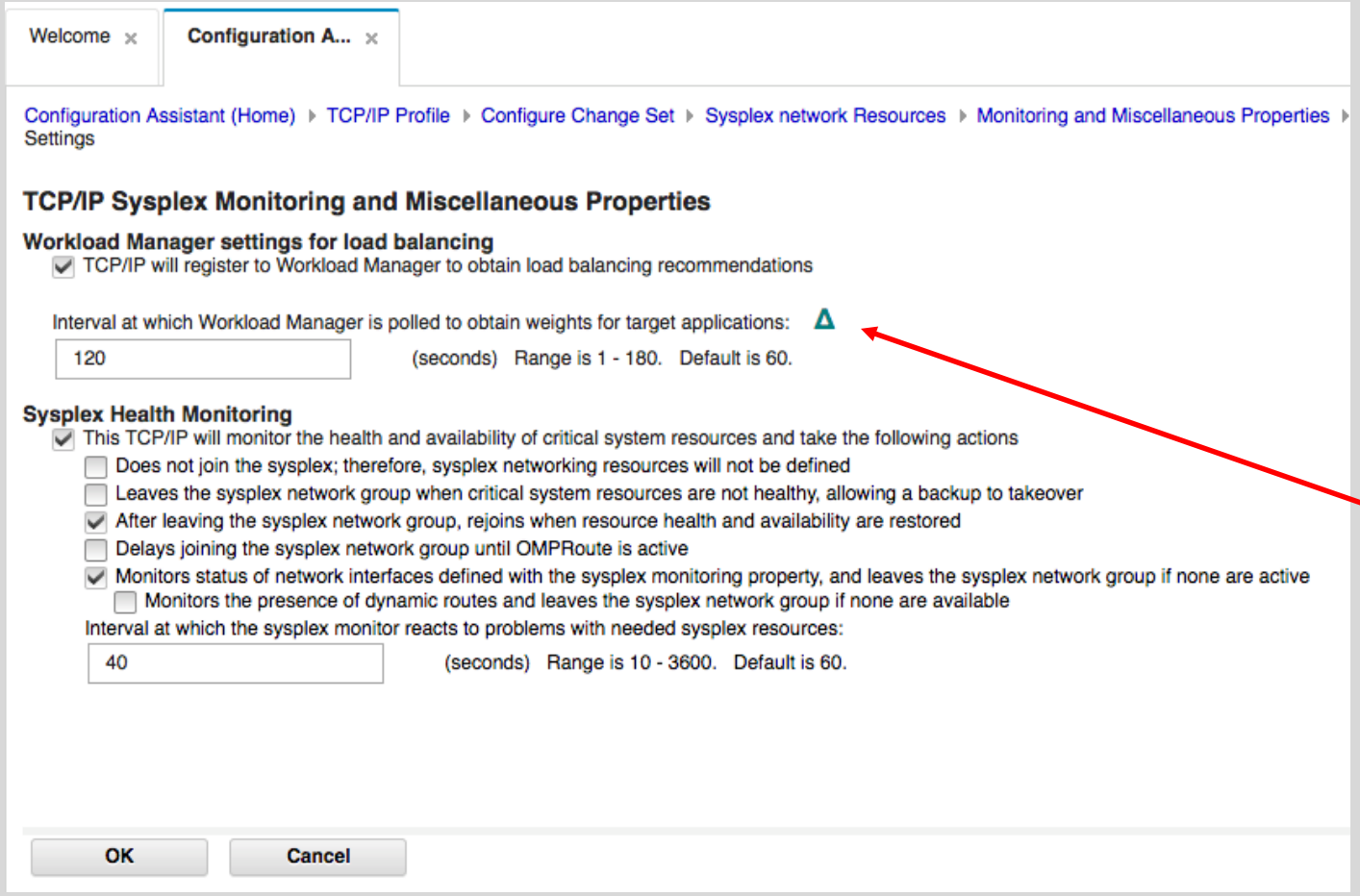
Creating a sysplex change set





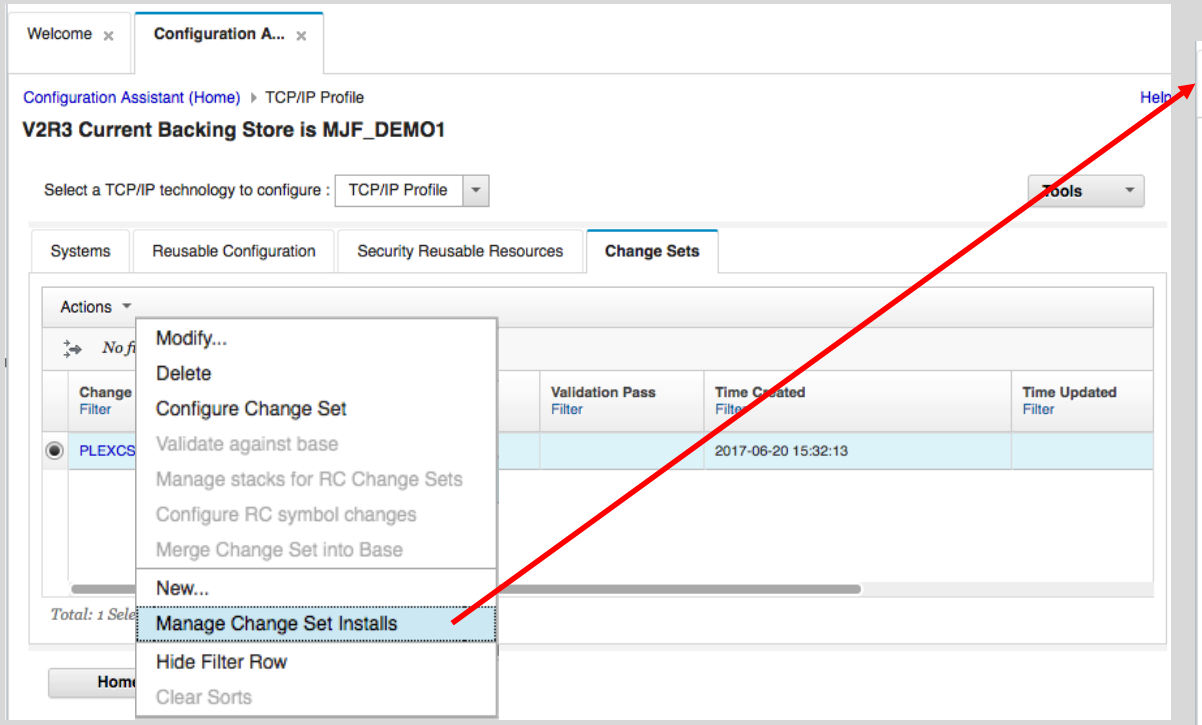
A change set can only be based on a sysplex if every stack in the sysplex has an install status of “Installed”.

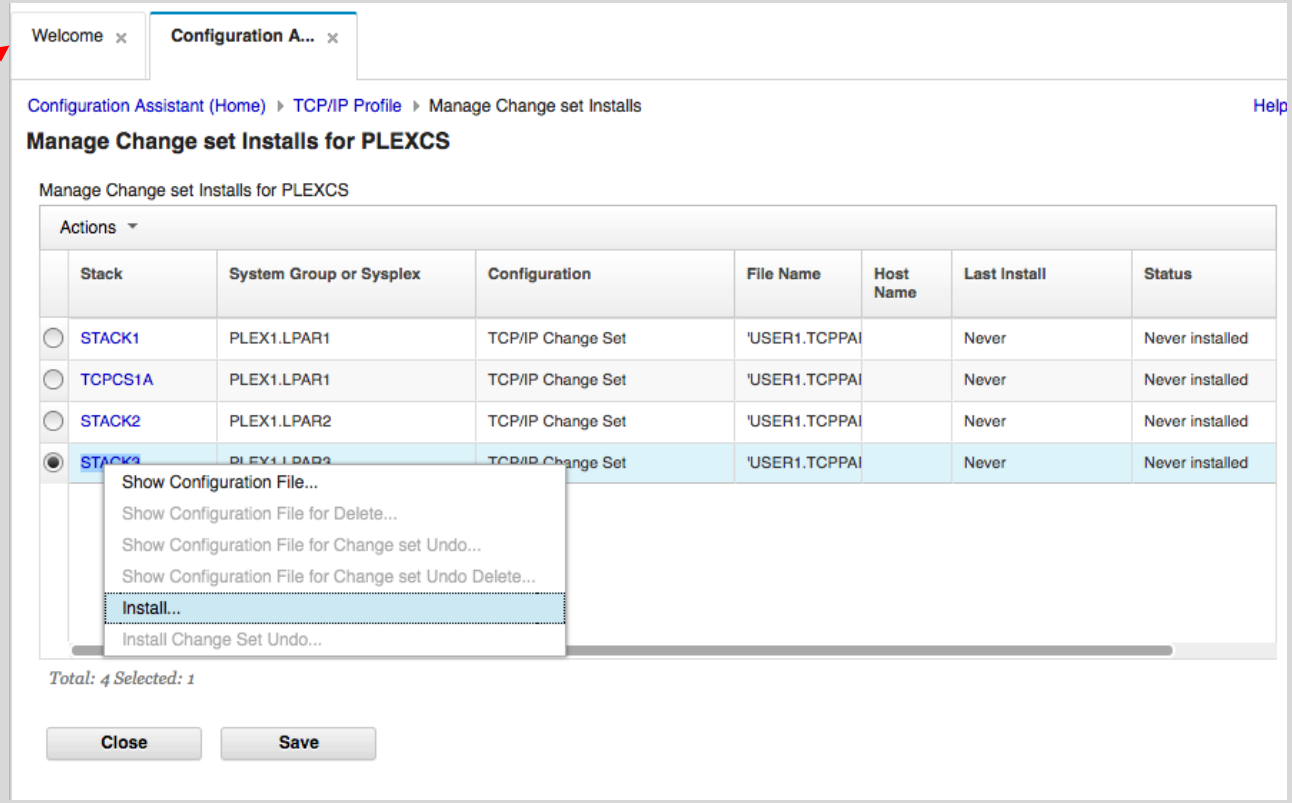
Configuring sysplex changes



Similar to the other change set types, you simply make the changes you want in the GUI. In this example, we have changed the Workload Manager polling interval to 120 seconds.

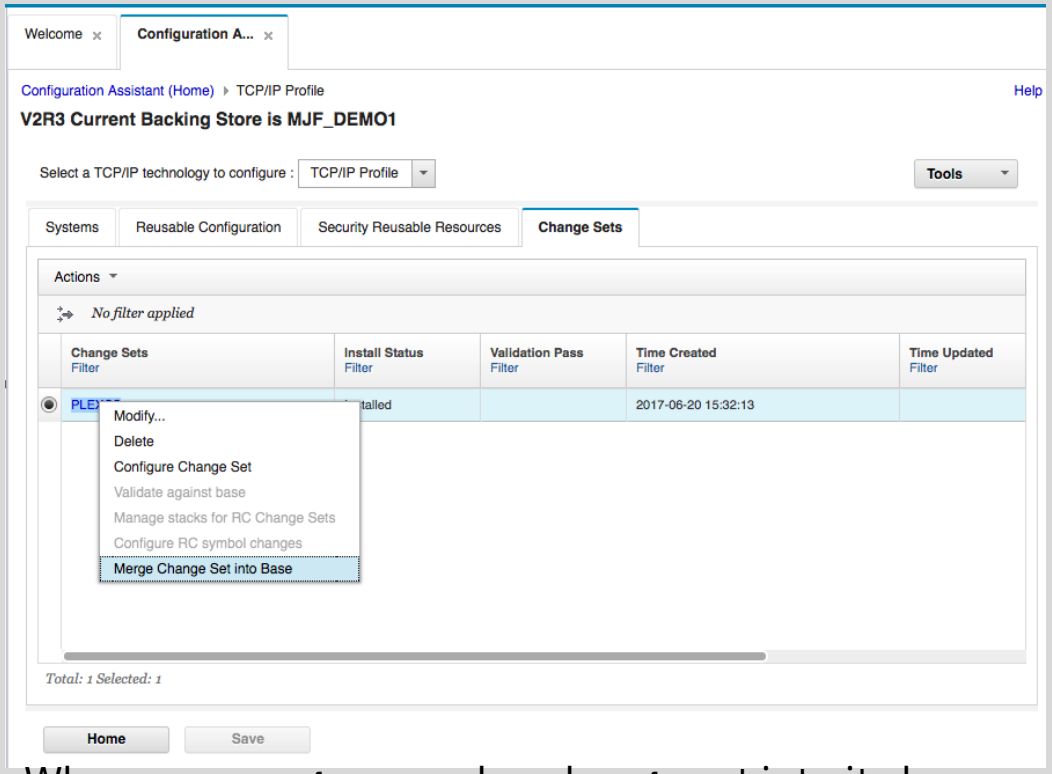
Sysplex change set installation

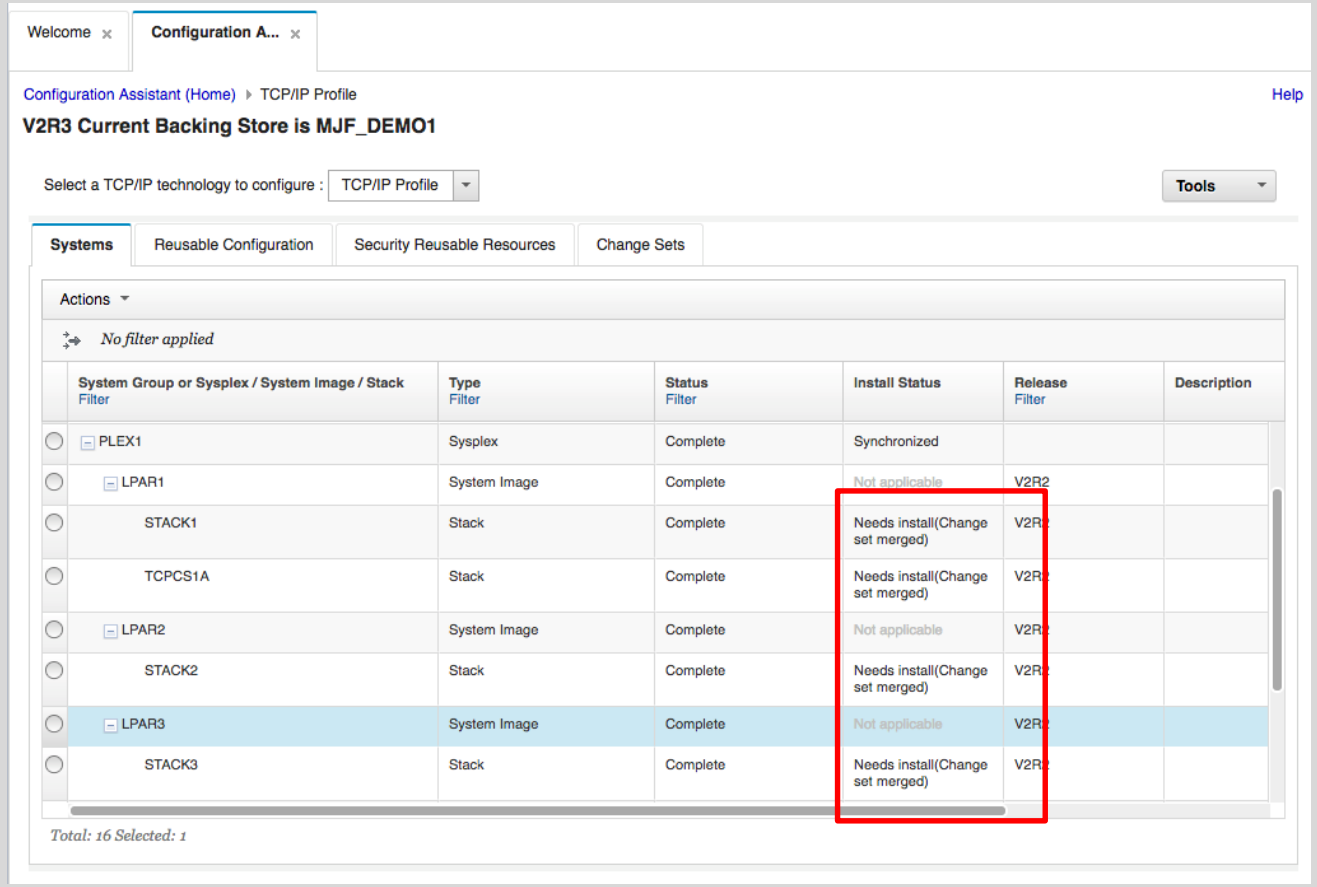




When you install a sysplex change set, Network Configuration Assistant automatically generates OBEY files for every stack in the sysplex that is affected by the change. You can then view, install, and undo the changes on a stack by stack basis.

Merging a sysplex change set





When you merge a sysplex change set into its base sysplex, the sysplex is updated to match the change set configuration, the changes are pushed to each affected stack in the sysplex, and the sysplex is removed from the change set (if it was the only sysplex in the change set, the change set is deleted). Each affected stack must be reinstalled to make the changed configuration available for the next stack IPL

Sysplex change set restrictions

Reminder: When Network Configuration Assistant is creating an OBEY file for a change set, it creates the OBEY file necessary to change the base configuration to match the change set configuration. For this reason, Network Configuration Assistant must know exactly what is in the base TCP/IP configuration on the MVS image to correctly generate this file.

This requirement results in two main change set restrictions:

1. A change set can only be based on installed configuration.
    - For a sysplex change set, this means that every stack in the sysplex have an install status of “Installed” for the sysplex to be eligible to have a change set based on it.
2. Configuration with a change set based on it cannot be edited.
    - For a sysplex change set, this means that a sysplex with a change set based on it cannot be edited in the Network Configuration Assistant. It also means that none of the stacks that are in a sysplex that has a change set based on it can be edited. These restrictions are in place until the change set is merged or deleted.

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