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configuring cisco cross-site port-channels with san-os
revision 0.1

synopsis

The following is a simple document covering the creation of cross-site port-channels in a Cisco SAN-OS FC fabric.

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introduction

Nothing is hard once you know how to do it. When it comes to creating port-channels between two director-class Cisco MDS 9513 switches this is very much the case. While it is generally recommended that you use the port-channel wizard in Fabric Manager to perform these kinds of activities, understanding what is happening via the command line is a good way to understand the process required to make it all work.

The following examples were taken from a production configuration of two MDS directors located at data centres approximately 50 kilometres from each other. One of the 9513s was already running production data VSANs, while the other was a new switch with no configuration.

The design called for two replication VSANs to be carried across the 16Gbps port-channel. The idea behind this is that, if for some reason it was necessary to bring down a VSAN, replication traffic – at least for one storage processor – could still be carried across the link.

The commands used in this document were tested on Cisco SAN-OS 3.3(4a), the release notes for which can be found at http://www.cisco.com/en/US/docs/storage/san_switches/mds9000/sw/rel_3_x/release/notes/14116.13.html. Most of these commands should work with NX-OS, but I strongly recommend you test this in a non-production environment first.

overview

The overall process is fairly simple, and I've included a brief list of activities below:

- Cable the switches as required (this is a prerequisite);
- Confirm which port-channels and VSANs are configured (if any);
- Create new VSANs;
- Assign persistent Domain IDs to the VSANs as you configure them;
- Add the appropriate interfaces to the VSANs;
- Create the port-channel and add interfaces and VSANs;
- Enable trunk mode on the port-channel;
- Enable the interfaces;
- Do roughly the same for the other switch;
- Test and profit!

The one thing I will say is that, like all implementations, you should be scratching your head and wondering what variables you want to use during implementation. If you haven't taken the time to design before you deploy, you're in for a world of hurt.

process

You can use putty or similar as your terminal emulation program. Start by logging in and feeling the warm and fuzzies when you see GNU GPL on the opening page.

```
login as: admin
MDS Switch
Using keyboard-interactive authentication.
Password:
Cisco Storage Area Networking Operating System (SAN-OS) Software
TAC support: http://www.cisco.com/tac
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The copyrights to certain works contained herein are owned by
other third parties and are used and distributed under license.
Some parts of this software may be covered under the GNU Public
License or the GNU Lesser General Public License. A copy of
each such license is available at
http://www.gnu.org/licenses/gpl.html and
http://www.gnu.org/licenses/lgpl.html
```

confirm existing port-channels and VSANs

The first step is to check the current VSAN membership – this will also show the port-channels configured on the switch.

```
9513A# show vsan membership
vsan 1 interfaces:
  fc5/7          fc5/11         fc5/12         fc5/13
  fc5/14         fc5/15         fc5/17         fc5/18
  fc5/19         fc5/23         fc5/24         fc6/7
  fc6/11         fc6/12         fc6/13         fc6/14
  fc6/15         fc6/17         fc6/18         fc6/19
  fc6/23         fc6/24

vsan 2 interfaces:
  fc1/1          fc1/2          fc1/3          fc1/4
  fc1/5          fc1/6          fc1/7          fc1/8
  fc1/9          fc1/10         fc1/11         fc1/12
  fc3/1          fc3/3          fc3/4          fc3/5
  fc3/6          fc3/7          fc3/8          fc3/9
  fc3/10         fc3/11         fc3/12         fc4/1
  fc5/1          fc5/3          fc5/5          fc5/9
  fc5/10         fc5/16         fc5/20         fc6/1
  fc6/3          fc6/5          fc6/9          fc6/10
  fc6/16         fc6/20         port-channel 1 port-channel 2
```

```

port-channel 3    port-channel 4    port-channel 10   port-channel 11
port-channel 14   port-channel 16   port-channel 18   port-channel 20
port-channel 22

vsan 3 interfaces:
fc2/1            fc2/2            fc2/3            fc2/4
fc2/5            fc2/6            fc2/7            fc2/8
fc2/9            fc2/10           fc2/11           fc2/12
fc3/2            fc4/2            fc4/3            fc4/4
fc4/5            fc4/6            fc4/7            fc4/8
fc4/9            fc4/10           fc4/11           fc4/12
fc5/2            fc5/4            fc5/6            fc5/8
fc5/21           fc5/22           fc6/2            fc6/4
fc6/6            fc6/8            fc6/21           fc6/22
port-channel 5   port-channel 6   port-channel 7   port-channel 8
port-channel 9   port-channel 12  port-channel 13  port-channel 15
port-channel 17  port-channel 19  port-channel 21  port-channel 23

```

create new VSANs

Configuration Terminal – because it's business time! Create the new VSANs for replication traffic between the sites and add some interfaces the VSAN.

```

9513A# conf t
Enter configuration commands, one per line.  End with CNTL/Z.
9513A(config)# vsan database
9513A(config-vsan-db)# vsan 8
9513A(config-vsan-db)# vsan 8 name "Replication Data Traffic VSAN 8"
9513A(config-vsan-db)# vsan 8 interface fc1/1, fc2/1, fc3/1, fc4/1

```

assign persistent domain IDs to the VSANs

Give the VSAN a persistent Domain ID.

```

9513A(config-vsan-db)# fcdomain domain 12 static vsan 8
9513A(config)# fcdomain fcid persistent vsan 8
FCID persistent feature is enabled.
9513A(config)# fcdomain priority 64 vsan 8
9513A(config)# end

```

Check your work

```

9513A# show vsan membership
vsan 1 interfaces:
fc5/7            fc5/11           fc5/12           fc5/13
fc5/14           fc5/15           fc5/17           fc5/18
fc5/19           fc5/23           fc5/24           fc6/7
fc6/11           fc6/12           fc6/13           fc6/14
fc6/15           fc6/17           fc6/18           fc6/19
fc6/23           fc6/24

vsan 2 interfaces:
fc1/2            fc1/3            fc1/4            fc1/5
fc1/6            fc1/7            fc1/8            fc1/9
fc1/10           fc1/11           fc1/12           fc3/3
fc3/4            fc3/5            fc3/6            fc3/7
fc3/8            fc3/9            fc3/10           fc3/11
fc3/12           fc5/1            fc5/3            fc5/5
fc5/9            fc5/10           fc5/16           fc5/20
fc6/1            fc6/3            fc6/5            fc6/9
fc6/10           fc6/16           fc6/20           port-channel 1
port-channel 2   port-channel 3   port-channel 4   port-channel 10
port-channel 11  port-channel 14  port-channel 16  port-channel 18
port-channel 20  port-channel 22

vsan 3 interfaces:
fc2/2            fc2/3            fc2/4            fc2/5
fc2/6            fc2/7            fc2/8            fc2/9
fc2/10           fc2/11           fc2/12           fc3/2

```

```

fc4/2          fc4/3          fc4/4          fc4/5
fc4/6          fc4/7          fc4/8          fc4/9
fc4/10         fc4/11         fc4/12         fc5/2
fc5/4          fc5/6          fc5/8          fc5/21
fc5/22         fc6/2          fc6/4          fc6/6
fc6/8          fc6/21         fc6/22         port-channel 5
port-channel 6 port-channel 7 port-channel 8 port-channel 9
port-channel 12 port-channel 13 port-channel 15 port-channel 17
port-channel 19 port-channel 21 port-channel 23

vsan 8 interfaces:
  fc1/1          fc2/1          fc3/1          fc4/1

vsan 4094(isolated_vsan) interfaces:

```

Now let's do the same thing for VSAN 9.

```

9513A# conf t
Enter configuration commands, one per line. End with CNTL/Z.
9513A(config)# vsan database
9513A(config-vsan-db)# vsan 9
9513A(config-vsan-db)# vsan 9 name "Replication Data Traffic VSAN 9"
9513A(config-vsan-db)# vsan 9 interface fc1/1
9513A(config-vsan-db)# fcdomain domain 13 static vsan 9
9513A(config)# fcdomain fcid persistent vsan 9
FCID persistent feature is enabled.
9513A(config)# fcdomain priority 64 vsan 9
9513A(config)# end
9513A# show vsan membership
vsan 1 interfaces:
  fc5/7          fc5/11         fc5/12         fc5/13
  fc5/14         fc5/15         fc5/17         fc5/18
  fc5/19         fc5/23         fc5/24         fc6/7
  fc6/11         fc6/12         fc6/13         fc6/14
  fc6/15         fc6/17         fc6/18         fc6/19
  fc6/23         fc6/24

vsan 2 interfaces:
  fc1/2          fc1/3          fc1/4          fc1/5
  fc1/6          fc1/7          fc1/8          fc1/9
  fc1/10         fc1/11         fc1/12         fc3/3
  fc3/4          fc3/5          fc3/6          fc3/7
  fc3/8          fc3/9          fc3/10         fc3/11
  fc3/12         fc5/1          fc5/3          fc5/5
  fc5/9          fc5/10         fc5/16         fc5/20
  fc6/1          fc6/3          fc6/5          fc6/9
  fc6/10         fc6/16         fc6/20         port-channel 1
  port-channel 2 port-channel 3 port-channel 4 port-channel 10
  port-channel 11 port-channel 14 port-channel 16 port-channel 18
  port-channel 20 port-channel 22

vsan 3 interfaces:
  fc2/2          fc2/3          fc2/4          fc2/5
  fc2/6          fc2/7          fc2/8          fc2/9
  fc2/10         fc2/11         fc2/12         fc3/2
  fc4/2          fc4/3          fc4/4          fc4/5
  fc4/6          fc4/7          fc4/8          fc4/9
  fc4/10         fc4/11         fc4/12         fc5/2
  fc5/4          fc5/6          fc5/8          fc5/21
  fc5/22         fc6/2          fc6/4          fc6/6
  fc6/8          fc6/21         fc6/22         port-channel 5
  port-channel 6 port-channel 7 port-channel 8 port-channel 9
  port-channel 12 port-channel 13 port-channel 15 port-channel 17
  port-channel 19 port-channel 21 port-channel 23

vsan 8 interfaces:
  fc2/1          fc3/1          fc4/1

vsan 9 interfaces:
  fc1/1

vsan 4094(isolated_vsan) interfaces:

```

In this example we added fc1/1 to VSAN 9, but then realised that we wanted to have the port-channel with all 4 ports and 2 VSANs traversing it. So we changed it back.

```

9513A# conf t
Enter configuration commands, one per line. End with CNTL/Z.
9513A(config)# vsan database
9513A(config-vsan-db)# vsan 8
9513A(config-vsan-db)# vsan 8 interface fc1/1
9513A(config-vsan-db)# end
9513A# show vsan membership
vsan 1 interfaces:
    fc5/7          fc5/11          fc5/12          fc5/13
    fc5/14         fc5/15          fc5/17          fc5/18
    fc5/19         fc5/23          fc5/24          fc6/7
    fc6/11         fc6/12          fc6/13          fc6/14
    fc6/15         fc6/17          fc6/18          fc6/19
    fc6/23         fc6/24

vsan 2 interfaces:
    fc1/2          fc1/3          fc1/4          fc1/5
    fc1/6          fc1/7          fc1/8          fc1/9
    fc1/10         fc1/11         fc1/12         fc3/3
    fc3/4          fc3/5          fc3/6          fc3/7
    fc3/8          fc3/9          fc3/10         fc3/11
    fc3/12         fc5/1          fc5/3          fc5/5
    fc5/9          fc5/10         fc5/16         fc5/20
    fc6/1          fc6/3          fc6/5          fc6/9
    fc6/10         fc6/16         fc6/20         port-channel 1
    port-channel 2 port-channel 3 port-channel 4 port-channel 10
    port-channel 11 port-channel 14 port-channel 16 port-channel 18
    port-channel 20 port-channel 22

vsan 3 interfaces:
    fc2/2          fc2/3          fc2/4          fc2/5
    fc2/6          fc2/7          fc2/8          fc2/9
    fc2/10         fc2/11         fc2/12         fc3/2
    fc4/2          fc4/3          fc4/4          fc4/5
    fc4/6          fc4/7          fc4/8          fc4/9
    fc4/10         fc4/11         fc4/12         fc5/2
    fc5/4          fc5/6          fc5/8          fc5/21
    fc5/22         fc6/2          fc6/4          fc6/6
    fc6/8          fc6/21         fc6/22         port-channel 5
    port-channel 6 port-channel 7 port-channel 8 port-channel 9
    port-channel 12 port-channel 13 port-channel 15 port-channel 17
    port-channel 19 port-channel 21 port-channel 23

vsan 8 interfaces:
    fc1/1          fc2/1          fc3/1          fc4/1

vsan 9 interfaces:

vsan 4094(isolated_vsan) interfaces:

```

The following command is a great way to see which interfaces are configured and operating on the switch.

```
9513A# show int brief
```

```

-----
Interface  Vsan  Admin  Admin  Status          SFP    Oper  Oper  Port
          Mode   Mode   Mode                    Mode  Mode  Speed Channel
          (Gbps)
-----
fc1/1      8      auto   on     down            swl    --    --    --
fc1/2      2      auto   on     down            swl    --    --    --
fc1/3      2      auto   on     trunking        swl    TE    4    --
fc1/4      2      auto   on     trunking        swl    TE    4    1
fc1/5      2      auto   on     trunking        swl    TE    4    2
fc1/6      2      auto   on     trunking        swl    TE    4    3
fc1/7      2      auto   on     trunking        swl    TE    4    4
fc1/8      2      auto   on     trunking        swl    TE    4    10
fc1/9      2      E      on     trunking        swl    TE    4    11
fc1/10     2      auto   on     up              swl    F     4    --
fc1/11     2      auto   on     up              swl    F     4    --
fc1/12     2      auto   on     notConnected    swl    --    --    --
fc2/1      8      auto   on     down            swl    --    --    --

```

| | | | | | | | |
|--------|---|------|----|--------------|-----|----|----|
| fc2/2 | 3 | auto | on | down | swl | -- | -- |
| fc2/3 | 3 | auto | on | trunking | swl | TE | 4 |
| fc2/4 | 3 | auto | on | trunking | swl | TE | 4 |
| fc2/5 | 3 | auto | on | trunking | swl | TE | 4 |
| fc2/6 | 3 | auto | on | trunking | swl | TE | 4 |
| fc2/7 | 3 | auto | on | trunking | swl | TE | 4 |
| fc2/8 | 3 | auto | on | trunking | swl | TE | 4 |
| fc2/9 | 3 | auto | on | trunking | swl | TE | 4 |
| fc2/10 | 3 | auto | on | up | swl | F | 4 |
| fc2/11 | 3 | auto | on | up | swl | F | 4 |
| fc2/12 | 3 | auto | on | trunking | swl | TE | 2 |
| fc3/1 | 8 | auto | on | down | swl | -- | -- |
| fc3/2 | 3 | auto | on | down | swl | -- | -- |
| fc3/3 | 2 | auto | on | trunking | swl | TE | 4 |
| fc3/4 | 2 | auto | on | trunking | swl | TE | 4 |
| fc3/5 | 2 | auto | on | trunking | swl | TE | 4 |
| fc3/6 | 2 | auto | on | trunking | swl | TE | 4 |
| fc3/7 | 2 | auto | on | trunking | swl | TE | 4 |
| fc3/8 | 2 | auto | on | trunking | swl | TE | 4 |
| fc3/9 | 2 | E | on | trunking | swl | TE | 4 |
| fc3/10 | 2 | auto | on | up | swl | F | 4 |
| fc3/11 | 2 | auto | on | up | swl | F | 4 |
| fc3/12 | 2 | E | on | notConnected | swl | -- | -- |
| fc4/1 | 8 | auto | on | down | swl | -- | -- |
| fc4/2 | 3 | auto | on | down | swl | -- | -- |
| fc4/3 | 3 | auto | on | trunking | swl | TE | 4 |
| fc4/4 | 3 | auto | on | trunking | swl | TE | 4 |
| fc4/5 | 3 | auto | on | trunking | swl | TE | 4 |
| fc4/6 | 3 | auto | on | trunking | swl | TE | 4 |
| fc4/7 | 3 | auto | on | trunking | swl | TE | 4 |
| fc4/8 | 3 | auto | on | trunking | swl | TE | 4 |
| fc4/9 | 3 | auto | on | trunking | swl | TE | 4 |
| fc4/10 | 3 | auto | on | up | swl | F | 4 |
| fc4/11 | 3 | auto | on | up | swl | F | 4 |
| fc4/12 | 3 | auto | on | trunking | swl | TE | 2 |
| fc5/1 | 2 | E | on | trunking | swl | TE | 4 |
| fc5/2 | 3 | E | on | trunking | swl | TE | 4 |
| fc5/3 | 2 | FX | -- | down | swl | -- | -- |
| fc5/4 | 3 | auto | on | trunking | swl | TE | 2 |
| fc5/5 | 2 | FX | -- | outOfServc | swl | -- | -- |
| fc5/6 | 3 | FX | -- | outOfServc | swl | -- | -- |
| fc5/7 | 1 | E | on | down | swl | -- | -- |
| fc5/8 | 3 | auto | on | trunking | swl | TE | 2 |
| fc5/9 | 2 | auto | on | trunking | swl | TE | 2 |
| fc5/10 | 2 | auto | on | trunking | swl | TE | 2 |
| fc5/11 | 1 | FX | -- | down | swl | -- | -- |
| fc5/12 | 1 | FX | -- | down | swl | -- | -- |
| fc5/13 | 1 | FX | -- | down | swl | -- | -- |
| fc5/14 | 1 | FX | -- | down | swl | -- | -- |
| fc5/15 | 1 | FX | -- | down | swl | -- | -- |
| fc5/16 | 2 | auto | on | trunking | swl | TE | 2 |
| fc5/17 | 1 | FX | -- | down | swl | -- | -- |
| fc5/18 | 1 | FX | -- | down | swl | -- | -- |
| fc5/19 | 1 | FX | -- | down | swl | -- | -- |
| fc5/20 | 2 | auto | on | trunking | swl | TE | 2 |
| fc5/21 | 3 | auto | on | trunking | swl | TE | 2 |
| fc5/22 | 3 | auto | on | trunking | swl | TE | 2 |
| fc5/23 | 1 | FX | -- | down | swl | -- | -- |
| fc5/24 | 1 | FX | -- | down | swl | -- | -- |
| fc6/1 | 2 | E | on | trunking | swl | TE | 4 |
| fc6/2 | 3 | E | on | trunking | swl | TE | 4 |
| fc6/3 | 2 | FX | -- | down | swl | -- | -- |
| fc6/4 | 3 | auto | on | trunking | swl | TE | 2 |
| fc6/5 | 2 | FX | -- | outOfServc | swl | -- | -- |
| fc6/6 | 3 | FX | -- | outOfServc | swl | -- | -- |
| fc6/7 | 1 | FX | -- | down | swl | -- | -- |
| fc6/8 | 3 | auto | on | trunking | swl | TE | 2 |
| fc6/9 | 2 | auto | on | trunking | swl | TE | 2 |
| fc6/10 | 2 | auto | on | trunking | swl | TE | 2 |
| fc6/11 | 1 | FX | -- | down | swl | -- | -- |
| fc6/12 | 1 | FX | -- | down | swl | -- | -- |
| fc6/13 | 1 | FX | -- | down | swl | -- | -- |
| fc6/14 | 1 | FX | -- | down | swl | -- | -- |
| fc6/15 | 1 | FX | -- | down | swl | -- | -- |
| fc6/16 | 2 | auto | on | trunking | swl | TE | 2 |
| fc6/17 | 1 | FX | -- | down | swl | -- | -- |
| fc6/18 | 1 | FX | -- | down | swl | -- | -- |

| | | | | | | | |
|--------|---|------|----|----------|-----|----|------|
| fc6/19 | 1 | FX | -- | down | swl | -- | -- |
| fc6/20 | 2 | auto | on | trunking | swl | TE | 2 22 |
| fc6/21 | 3 | auto | on | trunking | swl | TE | 2 17 |
| fc6/22 | 3 | auto | on | trunking | swl | TE | 2 19 |
| fc6/23 | 1 | FX | -- | down | swl | -- | -- |
| fc6/24 | 1 | FX | -- | down | swl | -- | -- |

```
-----
Interface          Status          Speed
                   (Gbps)
-----
sup-fc0            up              1
-----
```

```
-----
Interface          Status          IP Address          Speed          MTU
-----
mgmt0              up              10.118.1.146/24    1 Gbps        1500
-----
```

```
-----
Interface          Vsan  Admin  Status          Oper  Oper  IP
                   Trunk  Mode   (Gbps)  Address
                   Mode
-----
port-channel 1     2     on     trunking        TE    8     --
port-channel 2     2     on     trunking        TE    8     --
port-channel 3     2     on     trunking        TE    8     --
port-channel 4     2     on     trunking        TE    8     --
port-channel 5     3     on     trunking        TE    8     --
port-channel 6     3     on     trunking        TE    8     --
port-channel 7     3     on     trunking        TE    8     --
port-channel 8     3     on     trunking        TE    8     --
port-channel 9     3     on     trunking        TE    4     --
port-channel 10    2     on     trunking        TE    8     --
port-channel 11    2     on     trunking        TE    8     --
port-channel 12    3     on     trunking        TE    8     --
port-channel 13    3     on     trunking        TE    8     --
port-channel 14    2     on     trunking        TE    8     --
port-channel 15    3     on     trunking        TE    8     --
port-channel 16    2     on     trunking        TE    4     --
port-channel 17    3     on     trunking        TE    4     --
port-channel 18    2     on     trunking        TE    4     --
port-channel 19    3     on     trunking        TE    4     --
port-channel 20    2     on     trunking        TE    4     --
port-channel 21    3     on     trunking        TE    4     --
port-channel 22    2     on     trunking        TE    4     --
port-channel 23    3     on     trunking        TE    4     --
9513A#
```

create the port-channel and add interfaces and VSANs

Now it's time to configure the port-channel and add in some interfaces. We also want to give it a snazzy name and designate which VSANs can traverse it.

```
9513A# conf t
Enter configuration commands, one per line. End with CNTL/Z.
9513A(config)# interface fc1/1, fc2/1, fc3/1, fc4/1
9513A(config-if)# channel-group 30
fc1/1 fc2/1 fc3/1 fc4/1 added to port-channel 30 and disabled
please do the same operation on the switch at the other end of the port-channel,
then do "no shutdown" at both ends to bring them up
9513A(config-if)# switchport description "to MDS9513 Port Channel 30"
9513A(config-if)# exit
9513A(config)# interface port-channel 30
9513A(config-if)# switchport trunk mode on
9513A(config-if)# switchport trunk allowed vsan 8-9
9513A(config-if)# exit
9513A(config)# end
```

The following commands provide further information on the state of the port-channel once it's configured. Notice that is still down.

```
9513A# show int port-channel 30
```

```
port-channel 30 is down (No operational members)
Hardware is Fibre Channel
Port WWN is 24:1e:00:0d:ec:5a:fa:80
Admin port mode is auto, trunk mode is on
snmp link state traps are enabled
Port vsan is 8
5 minutes input rate 0 bits/sec, 0 bytes/sec, 0 frames/sec
5 minutes output rate 0 bits/sec, 0 bytes/sec, 0 frames/sec
209646118996 frames input, 352904050161476 bytes
  0 discards, 0 errors
  0 CRC, 0 unknown class
  0 too long, 0 too short
97086516695 frames output, 137240835755072 bytes
  3 discards, 0 errors
54 input OLS, 54 LRR, 0 NOS, 127 loop inits
95 output OLS, 44 LRR, 58 NOS, 84 loop inits
Member[1] : fc1/1
Member[2] : fc2/1
Member[3] : fc3/1
Member[4] : fc4/1
```

Notice that VSAN 9 has no interfaces. This isn't a problem, as the interfaces and port-channel we've created earlier, while being members of VSAN 8, still allow traffic from both VSANs 8 and 9.

```
9513A# show vsan membership
vsan 1 interfaces:
  fc5/7          fc5/11          fc5/12          fc5/13
  fc5/14         fc5/15          fc5/17          fc5/18
  fc5/19         fc5/23          fc5/24          fc6/7
  fc6/11         fc6/12          fc6/13          fc6/14
  fc6/15         fc6/17          fc6/18          fc6/19
  fc6/23         fc6/24

vsan 2 interfaces:
  fc1/2          fc1/3          fc1/4          fc1/5
  fc1/6          fc1/7          fc1/8          fc1/9
  fc1/10         fc1/11         fc1/12         fc3/3
  fc3/4          fc3/5          fc3/6          fc3/7
  fc3/8          fc3/9          fc3/10         fc3/11
  fc3/12         fc5/1          fc5/3          fc5/5
  fc5/9          fc5/10         fc5/16         fc5/20
  fc6/1          fc6/3          fc6/5          fc6/9
  fc6/10         fc6/16         fc6/20         port-channel 1
  port-channel 2  port-channel 3  port-channel 4  port-channel 10
  port-channel 11 port-channel 14 port-channel 16 port-channel 18
  port-channel 20 port-channel 22

vsan 3 interfaces:
  fc2/2          fc2/3          fc2/4          fc2/5
  fc2/6          fc2/7          fc2/8          fc2/9
  fc2/10         fc2/11         fc2/12         fc3/2
  fc4/2          fc4/3          fc4/4          fc4/5
  fc4/6          fc4/7          fc4/8          fc4/9
  fc4/10         fc4/11         fc4/12         fc5/2
  fc5/4          fc5/6          fc5/8          fc5/21
  fc5/22         fc6/2          fc6/4          fc6/6
  fc6/8          fc6/21         fc6/22         port-channel 5
  port-channel 6  port-channel 7  port-channel 8  port-channel 9
  port-channel 12 port-channel 13 port-channel 15 port-channel 17
  port-channel 19 port-channel 21 port-channel 23

vsan 8 interfaces:
  fc1/1          fc2/1          fc3/1          fc4/1
  port-channel 30

vsan 9 interfaces:

vsan 4094(isolated_vsan) interfaces:
```

do roughly the same for the other switch

At this point, we go to Site B and configure the VSANs and port-channels as we did on Site A.

```

9513B# conf t
Enter configuration commands, one per line. End with CNTL/Z.
9513B(config)# vsan database
9513B(config-vsan-db)# vsan 8
9513B(config-vsan-db)# vsan 8 name "Replication Data Traffic VSAN 8"
9513B(config-vsan-db)# vsan 8 interface fc1/1, fc2/1, fc3/1, fc4/1
9513B(config-vsan-db)# fcdomain domain 10 static vsan 8
9513B(config)# fcdomain fcid persistent vsan 8
FCID persistent feature is enabled.
9513B(config)# vsan database
9513B(config-vsan-db)# vsan 9
9513B(config-vsan-db)# vsan 9 name "Replication Data Traffic VSAN 9"
9513B(config-vsan-db)# fcdomain domain 11 static vsan 9
9513B(config)# fcdomain fcid persistent vsan 9
FCID persistent feature is enabled.
9513B(config)# end
9513B# show vsan membership
vsan 1 interfaces:
    fc1/2          fc1/3          fc1/4          fc1/5
    fc1/6          fc1/8          fc1/10         fc1/11
    fc1/12         fc1/13        fc1/14         fc1/15
    fc1/16         fc1/17        fc1/18         fc1/19
    fc1/20         fc1/22        fc1/23         fc1/24
    fc2/2          fc2/3          fc2/4          fc2/5
    fc2/6          fc2/8          fc2/9          fc2/10
    fc2/11         fc2/12        fc2/14         fc2/15
    fc2/16         fc2/17        fc2/18         fc2/20
    fc2/21         fc2/22        fc2/23         fc2/24
    fc3/2          fc3/3          fc3/4          fc3/5
    fc3/6          fc3/8          fc3/9          fc3/10
    fc3/11         fc3/12        fc3/14         fc3/15
    fc3/16         fc3/17        fc3/18         fc3/19
    fc3/20         fc3/22        fc3/23         fc3/24
    fc4/2          fc4/3          fc4/4          fc4/5
    fc4/6          fc4/7          fc4/8          fc4/10
    fc4/11         fc4/12        fc4/14         fc4/15
    fc4/16         fc4/17        fc4/18         fc4/20
    fc4/21         fc4/22        fc4/23         fc4/24

vsan 8 interfaces:
    fc1/1          fc2/1          fc3/1          fc4/1

vsan 9 interfaces:

vsan 12 interfaces:
    fc1/7          fc1/9          fc2/7          fc3/7
    fc4/9          fc4/19        port-channel 24  port-channel 26
    port-channel 28

vsan 13 interfaces:
    fc1/21         fc2/13        fc2/19        fc3/13
    fc3/21         fc4/13        port-channel 25  port-channel 27
    port-channel 29

vsan 4094(isolated_vsan) interfaces:

```

While we're here, let's add the CLARiiON's MirrorView ports into the appropriate VSANs as well. Do the same for Site A if you haven't already done so. Otherwise you may have difficulty zoning your MirrorView ports together.

```

9513B# conf t
Enter configuration commands, one per line. End with CNTL/Z.
9513B(config)# vsan database
9513B(config-vsan-db)# vsan 8
9513B(config-vsan-db)# vsan 8 interface fc4/2
9513B(config-vsan-db)# exit
9513B(config)# vsan database
9513B(config-vsan-db)# vsan 9
9513B(config-vsan-db)# vsan 9 interface fc3/2
9513B(config-vsan-db)# end

```

Before we create the port-channel, let's make sure the ports are shut down. We didn't do this at Site A because they were already down.

```
9513B# conf t
Enter configuration commands, one per line. End with CNTL/Z.
9513B(config)# interface fc1/1
9513B(config-if)# shut
9513B(config-if)# interface fc2/1
9513B(config-if)# shut
9513B(config-if)# interface fc3/1
9513B(config-if)# shut
9513B(config-if)# interface fc4/1
9513B(config-if)# shut
9513B(config-if)# end
```

Now we create the same port-channel (30) as we did on Site A and add some interfaces to it.

```
9513B# conf t
Enter configuration commands, one per line. End with CNTL/Z.
9513B(config)# interface fc1/1, fc2/1, fc3/1, fc4/1
9513B(config-if)# channel-group 30
fc1/1 fc2/1 fc3/1 fc4/1 added to port-channel 30 and disabled
please do the same operation on the switch at the other end of the port-channel,
then do "no shutdown" at both ends to bring them up
9513B(config-if)# switchport description "to MDS9513 Port Channel 30"
9513B(config-if)# exit
9513B(config)# interface port-channel 30
9513B(config-if)# switchport trunk mode on
9513B(config-if)# switchport trunk allowed vsan 8-9
9513B(config-if)# exit
9513B(config)# end
```

enable the interfaces

So now you have the VSANs and port-channels configured on both sites, it's time to fire up the port-channel and its associated interfaces.

```
9513A# conf t
Enter configuration commands, one per line. End with CNTL/Z.
9513A(config)# interface port-channel 30
9513A(config-if)# no shut
9513A(config-if)# exit
9513A(config)# interface fc1/1
9513A(config-if)# no shut
9513A(config-if)# exit
9513A(config)# interface fc2/1
9513A(config-if)# no shut
9513A(config-if)# do show interface brief
```

```
-----
```

| Interface | Vsan | Admin Mode | Admin Trunk Mode | Status | SFP | Oper Mode | Oper Speed (Gbps) | Port Channel |
|-----------|------|------------|------------------|--------------|-----|-----------|-------------------|--------------|
| fc1/1 | 8 | auto | on | trunking | sw1 | TE | 4 | 30 |
| fc1/2 | 2 | auto | on | down | sw1 | -- | | -- |
| fc1/3 | 2 | auto | on | trunking | sw1 | TE | 4 | -- |
| fc1/4 | 2 | auto | on | trunking | sw1 | TE | 4 | 1 |
| fc1/5 | 2 | auto | on | trunking | sw1 | TE | 4 | 2 |
| fc1/6 | 2 | auto | on | trunking | sw1 | TE | 4 | 3 |
| fc1/7 | 2 | auto | on | trunking | sw1 | TE | 4 | 4 |
| fc1/8 | 2 | auto | on | trunking | sw1 | TE | 4 | 10 |
| fc1/9 | 2 | E | on | trunking | sw1 | TE | 4 | 11 |
| fc1/10 | 2 | auto | on | up | sw1 | F | 4 | -- |
| fc1/11 | 2 | auto | on | up | sw1 | F | 4 | -- |
| fc1/12 | 2 | auto | on | notConnected | sw1 | -- | | -- |
| fc2/1 | 8 | auto | on | trunking | sw1 | TE | 4 | 30 |
| fc2/2 | 3 | auto | on | down | sw1 | -- | | -- |
| fc2/3 | 3 | auto | on | trunking | sw1 | TE | 4 | -- |
| fc2/4 | 3 | auto | on | trunking | sw1 | TE | 4 | 5 |
| fc2/5 | 3 | auto | on | trunking | sw1 | TE | 4 | 6 |
| fc2/6 | 3 | auto | on | trunking | sw1 | TE | 4 | 7 |

```
-----
```

```

fc2/7      3      auto  on      trunking  swl  TE      4      8
fc2/8      3      auto  on      trunking  swl  TE      4      12
fc2/9      3      auto  on      trunking  swl  TE      4      13
fc2/10     3      auto  on      up        swl  F       4      --
fc2/11     3      auto  on      up        swl  F       4      --
fc2/12     3      auto  on      trunking  swl  TE      2      9
fc3/1      8      auto  on      down     swl  --      --      30
fc3/2      3      auto  on      down     swl  --      --      --
fc3/3      2      auto  on      trunking  swl  TE      4      --
fc3/4      2      auto  on      trunking  swl  TE      4      1
fc3/5      2      auto  on      trunking  swl  TE      4      2
fc3/6      2      auto  on      trunking  swl  TE      4      3
fc3/7      2      auto  on      trunking  swl  TE      4      4
9513A(config-if)# exit
9513A(config)# interface fc3/1
9513A(config-if)# no shut
9513A(config-if)# do show interface brief

```

| Interface | Vsan | Admin Mode | Admin Trunk Mode | Status | SFP | Oper Mode | Oper Speed (Gbps) | Port Channel |
|-----------|------|------------|------------------|--------------|-----|-----------|-------------------|--------------|
| fc1/1 | 8 | auto | on | trunking | swl | TE | 4 | 30 |
| fc1/2 | 2 | auto | on | down | swl | -- | | -- |
| fc1/3 | 2 | auto | on | trunking | swl | TE | 4 | -- |
| fc1/4 | 2 | auto | on | trunking | swl | TE | 4 | 1 |
| fc1/5 | 2 | auto | on | trunking | swl | TE | 4 | 2 |
| fc1/6 | 2 | auto | on | trunking | swl | TE | 4 | 3 |
| fc1/7 | 2 | auto | on | trunking | swl | TE | 4 | 4 |
| fc1/8 | 2 | auto | on | trunking | swl | TE | 4 | 10 |
| fc1/9 | 2 | E | on | trunking | swl | TE | 4 | 11 |
| fc1/10 | 2 | auto | on | up | swl | F | 4 | -- |
| fc1/11 | 2 | auto | on | up | swl | F | 4 | -- |
| fc1/12 | 2 | auto | on | notConnected | swl | -- | | -- |
| fc2/1 | 8 | auto | on | trunking | swl | TE | 4 | 30 |
| fc2/2 | 3 | auto | on | down | swl | -- | | -- |
| fc2/3 | 3 | auto | on | trunking | swl | TE | 4 | -- |
| fc2/4 | 3 | auto | on | trunking | swl | TE | 4 | 5 |
| fc2/5 | 3 | auto | on | trunking | swl | TE | 4 | 6 |
| fc2/6 | 3 | auto | on | trunking | swl | TE | 4 | 7 |
| fc2/7 | 3 | auto | on | trunking | swl | TE | 4 | 8 |
| fc2/8 | 3 | auto | on | trunking | swl | TE | 4 | 12 |
| fc2/9 | 3 | auto | on | trunking | swl | TE | 4 | 13 |
| fc2/10 | 3 | auto | on | up | swl | F | 4 | -- |
| fc2/11 | 3 | auto | on | up | swl | F | 4 | -- |
| fc2/12 | 3 | auto | on | trunking | swl | TE | 2 | 9 |
| fc3/1 | 8 | auto | on | trunking | swl | TE | 4 | 30 |
| fc3/2 | 3 | auto | on | down | swl | -- | | -- |
| fc3/3 | 2 | auto | on | trunking | swl | TE | 4 | -- |
| fc3/4 | 2 | auto | on | trunking | swl | TE | 4 | 1 |
| fc3/5 | 2 | auto | on | trunking | swl | TE | 4 | 2 |
| fc3/6 | 2 | auto | on | trunking | swl | TE | 4 | 3 |
| fc3/7 | 2 | auto | on | trunking | swl | TE | 4 | 4 |

```

9513A(config-if)# exit
9513A(config)# interface fc4/1
9513A(config-if)# no shut
9513A(config-if)# do show int brief

```

| Interface | Vsan | Admin Mode | Admin Trunk Mode | Status | SFP | Oper Mode | Oper Speed (Gbps) | Port Channel |
|-----------|------|------------|------------------|--------------|-----|-----------|-------------------|--------------|
| fc1/1 | 8 | auto | on | trunking | swl | TE | 4 | 30 |
| fc1/2 | 2 | auto | on | down | swl | -- | | -- |
| fc1/3 | 2 | auto | on | trunking | swl | TE | 4 | -- |
| fc1/4 | 2 | auto | on | trunking | swl | TE | 4 | 1 |
| fc1/5 | 2 | auto | on | trunking | swl | TE | 4 | 2 |
| fc1/6 | 2 | auto | on | trunking | swl | TE | 4 | 3 |
| fc1/7 | 2 | auto | on | trunking | swl | TE | 4 | 4 |
| fc1/8 | 2 | auto | on | trunking | swl | TE | 4 | 10 |
| fc1/9 | 2 | E | on | trunking | swl | TE | 4 | 11 |
| fc1/10 | 2 | auto | on | up | swl | F | 4 | -- |
| fc1/11 | 2 | auto | on | up | swl | F | 4 | -- |
| fc1/12 | 2 | auto | on | notConnected | swl | -- | | -- |
| fc2/1 | 8 | auto | on | trunking | swl | TE | 4 | 30 |

```

fc2/2      3      auto  on      down      swl  --      --
fc2/3      3      auto  on      trunking  swl  TE      4      --
fc2/4      3      auto  on      trunking  swl  TE      4      5
fc2/5      3      auto  on      trunking  swl  TE      4      6
fc2/6      3      auto  on      trunking  swl  TE      4      7
fc2/7      3      auto  on      trunking  swl  TE      4      8
fc2/8      3      auto  on      trunking  swl  TE      4      12
fc2/9      3      auto  on      trunking  swl  TE      4      13
fc2/10     3      auto  on      up        swl  F       4      --
fc2/11     3      auto  on      up        swl  F       4      --
fc2/12     3      auto  on      trunking  swl  TE      2      9
fc3/1      8      auto  on      trunking  swl  TE      4      30
fc3/2      3      auto  on      down      swl  --      --
fc3/3      2      auto  on      trunking  swl  TE      4      --
fc3/4      2      auto  on      trunking  swl  TE      4      1
fc3/5      2      auto  on      trunking  swl  TE      4      2
fc3/6      2      auto  on      trunking  swl  TE      4      3
fc3/7      2      auto  on      trunking  swl  TE      4      4
fc3/8      2      auto  on      trunking  swl  TE      4      10
fc3/9      2      E     on      trunking  swl  TE      4      11
fc3/10     2      auto  on      up        swl  F       4      --
fc3/11     2      auto  on      up        swl  F       4      --
fc3/12     2      E     on      notConnected  swl  --      --
fc4/1      8      auto  on      trunking  swl  TE      4      30
fc4/2      3      auto  on      down      swl  --      --
fc4/3      3      auto  on      trunking  swl  TE      4      --
fc4/4      3      auto  on      trunking  swl  TE      4      5
fc4/5      3      auto  on      trunking  swl  TE      4      6
fc4/6      3      auto  on      trunking  swl  TE      4      7
fc4/7      3      auto  on      trunking  swl  TE      4      8
fc4/8      3      auto  on      trunking  swl  TE      4      12
fc4/9      3      auto  on      trunking  swl  TE      4      13
fc4/10     3      auto  on      up        swl  F       4      --
fc4/11     3      auto  on      up        swl  F       4      --
fc4/12     3      auto  on      trunking  swl  TE      2      9
fc5/1      2      E     on      trunking  swl  TE      4      14
fc5/2      3      E     on      trunking  swl  TE      4      15
fc5/3      2      FX    --      down      swl  --      --
fc5/4      3      auto  on      trunking  swl  TE      2      21
fc5/5      2      FX    --      outOfServc  swl  --      --
fc5/6      3      FX    --      outOfServc  swl  --      --
fc5/7      1      E     on      down      swl  --      --
fc5/8      3      auto  on      trunking  swl  TE      2      23
fc5/9      2      auto  on      trunking  swl  TE      2      16
fc5/10     2      auto  on      trunking  swl  TE      2      18
fc5/11     1      FX    --      down      swl  --      --
fc5/12     1      FX    --      down      swl  --      --
fc5/13     1      FX    --      down      swl  --      --
fc5/14     1      FX    --      down      swl  --      --
fc5/15     1      FX    --      down      swl  --      --
fc5/16     2      auto  on      trunking  swl  TE      2      20
fc5/17     1      FX    --      down      swl  --      --
fc5/18     1      FX    --      down      swl  --      --
fc5/19     1      FX    --      down      swl  --      --
fc5/20     2      auto  on      trunking  swl  TE      2      22
9513A(config-if)# end

```

Once you've bought the ports up on one side, you need to do the same process on the other side. So let's bring up the port-channel and its ports.

```

9513B# conf t
Enter configuration commands, one per line. End with CNTL/Z.
9513B(config)# interface port-channel 30
9513B(config-if)# no shut
9513B(config-if)# exit
9513B(config)# interface fc1/1
9513B(config-if)# no shut
9513B(config-if)# do show interface brief

```

```

-----
Interface  Vsan  Admin  Admin  Status          SFP  Oper  Oper  Port
         Mode  Mode  Trunk  Mode              Mode Speed  Channel
         Mode                               (Gbps)
-----
fc1/1      8      auto  on      trunking        swl  TE    4     30

```

| | | | | | | | |
|--------|----|------|----|----------|-----|----|------|
| fc1/2 | 1 | FX | -- | down | swl | -- | -- |
| fc1/3 | 1 | FX | -- | down | swl | -- | -- |
| fc1/4 | 1 | FX | -- | down | swl | -- | -- |
| fc1/5 | 1 | FX | -- | down | swl | -- | -- |
| fc1/6 | 1 | FX | -- | down | swl | -- | -- |
| fc1/7 | 12 | auto | on | trunking | swl | TE | 2 24 |
| fc1/8 | 1 | FX | -- | down | swl | -- | -- |
| fc1/9 | 12 | auto | on | trunking | swl | TE | 2 28 |
| fc1/10 | 1 | FX | -- | down | swl | -- | -- |
| fc1/11 | 1 | FX | -- | down | swl | -- | -- |
| fc1/12 | 1 | FX | -- | down | swl | -- | -- |
| fc1/13 | 1 | FX | -- | down | swl | -- | -- |
| fc1/14 | 1 | FX | -- | down | swl | -- | -- |
| fc1/15 | 1 | FX | -- | down | swl | -- | -- |
| fc1/16 | 1 | FX | -- | down | swl | -- | -- |
| fc1/17 | 1 | FX | -- | down | swl | -- | -- |
| fc1/18 | 1 | FX | -- | down | swl | -- | -- |
| fc1/19 | 1 | FX | -- | down | swl | -- | -- |
| fc1/20 | 1 | FX | -- | down | swl | -- | -- |
| fc1/21 | 13 | auto | on | trunking | swl | TE | 2 25 |
| fc1/22 | 1 | FX | -- | down | swl | -- | -- |
| fc1/23 | 1 | FX | -- | down | swl | -- | -- |
| fc1/24 | 1 | FX | -- | down | swl | -- | -- |
| fc2/1 | 8 | auto | on | down | swl | -- | 30 |
| fc2/2 | 1 | FX | -- | down | swl | -- | -- |
| fc2/3 | 1 | FX | -- | down | swl | -- | -- |
| fc2/4 | 1 | FX | -- | down | swl | -- | -- |
| fc2/5 | 1 | FX | -- | down | swl | -- | -- |
| fc2/6 | 1 | FX | -- | down | swl | -- | -- |
| fc2/7 | 12 | auto | on | trunking | swl | TE | 2 26 |
| fc2/8 | 1 | FX | -- | down | swl | -- | -- |
| fc2/9 | 1 | FX | -- | down | swl | -- | -- |
| fc2/10 | 1 | FX | -- | down | swl | -- | -- |
| fc2/11 | 1 | FX | -- | down | swl | -- | -- |
| fc2/12 | 1 | FX | -- | down | swl | -- | -- |
| fc2/13 | 13 | auto | on | trunking | swl | TE | 2 29 |
| fc2/14 | 1 | FX | -- | down | swl | -- | -- |
| fc2/15 | 1 | FX | -- | down | swl | -- | -- |
| fc2/16 | 1 | FX | -- | down | swl | -- | -- |
| fc2/17 | 1 | FX | -- | down | swl | -- | -- |
| fc2/18 | 1 | FX | -- | down | swl | -- | -- |
| fc2/19 | 13 | auto | on | trunking | swl | TE | 2 27 |
| fc2/20 | 1 | FX | -- | down | swl | -- | -- |
| fc2/21 | 1 | FX | -- | down | swl | -- | -- |
| fc2/22 | 1 | FX | -- | down | swl | -- | -- |
| fc2/23 | 1 | FX | -- | down | swl | -- | -- |
| fc2/24 | 1 | FX | -- | down | swl | -- | -- |
| fc3/1 | 8 | auto | on | down | swl | -- | 30 |
| fc3/2 | 9 | FX | -- | down | swl | -- | -- |
| fc3/3 | 1 | FX | -- | down | swl | -- | -- |
| fc3/4 | 1 | FX | -- | down | swl | -- | -- |
| fc3/5 | 1 | FX | -- | down | swl | -- | -- |
| fc3/6 | 1 | FX | -- | down | swl | -- | -- |
| fc3/7 | 12 | auto | on | trunking | swl | TE | 2 28 |
| fc3/8 | 1 | FX | -- | down | swl | -- | -- |
| fc3/9 | 1 | FX | -- | down | swl | -- | -- |

```

9513B(config-if)# do show interface port-channel 30
port-channel 30 is trunking
  Hardware is Fibre Channel
  Port WWN is 24:1e:00:0d:ec:e0:f9:40
  Admin port mode is auto, trunk mode is on
  snmp link state traps are enabled
  Port mode is TE
  Port vsan is 8
  Speed is 16 Gbps
  Trunk vsans (admin allowed and active) (8-9)
  Trunk vsans (up) (8-9)
  Trunk vsans (isolated) ( )
  Trunk vsans (initializing) ( )
  5 minutes input rate 608 bits/sec, 76 bytes/sec, 0 frames/sec
  5 minutes output rate 472 bits/sec, 59 bytes/sec, 0 frames/sec
  225 frames input, 23620 bytes
    0 discards, 0 errors
    0 CRC, 0 unknown class
    0 too long, 0 too short

```

```

226 frames output, 18568 bytes
  0 discards, 0 errors
  1 input OLS, 2 LRR, 0 NOS, 11 loop inits
  1 output OLS, 1 LRR, 0 NOS, 1 loop inits
Member[1] : fc1/1
Member[2] : fc2/1
Member[3] : fc3/1
Member[4] : fc4/1
Interface last changed at Mon Nov 22 06:08:33 2010

```

Let's bring up the remaining ports and see what it looks like.

```

9513B(config-if)# exit
9513B(config)# interface fc2/1
9513B(config-if)# no shut
9513B(config-if)# do show interface fc2/1
fc2/1 is trunking
  Port description is to MDS9513 Port Channel 30
  Hardware is Fibre Channel, SFP is short wave laser w/o OFC (SN)
  Port WWN is 20:41:00:0d:ec:e0:f9:40
  Peer port WWN is 20:41:00:0d:ec:5a:fa:80
  Admin port mode is auto, trunk mode is on
  snmp link state traps are enabled
  Port mode is TE
  Port vsan is 8
  Speed is 4 Gbps
  Rate mode is dedicated
  Transmit B2B Credit is 250
  Receive B2B Credit is 250
  B2B State Change Number is 14
  Receive data field Size is 2112
  Beacon is turned off
  Belongs to port-channel 30
  Trunk vsans (admin allowed and active) (8-9)
  Trunk vsans (up) (8-9)
  Trunk vsans (isolated) ( )
  Trunk vsans (initializing) ( )
  5 minutes input rate 0 bits/sec, 0 bytes/sec, 0 frames/sec
  5 minutes output rate 0 bits/sec, 0 bytes/sec, 0 frames/sec
  17 frames input, 1884 bytes
    0 discards, 0 errors
    0 CRC, 0 unknown class
    0 too long, 0 too short
  11 frames output, 1184 bytes
    0 discards, 0 errors
  0 input OLS, 1 LRR, 0 NOS, 11 loop inits
  1 output OLS, 1 LRR, 0 NOS, 4 loop inits
  250 receive B2B credit remaining
  250 transmit B2B credit remaining
  235 low priority transmit B2B credit remaining

```

```
9513B(config-if)# do show interface brief
```

| Interface | Vsan | Admin Mode | Admin Trunk Mode | Status | SFP | Oper Mode | Oper Speed (Gbps) | Port Channel |
|-----------|------|------------|------------------|----------|-----|-----------|-------------------|--------------|
| fc1/1 | 8 | auto | on | trunking | sw1 | TE | 4 | 30 |
| fc1/2 | 1 | FX | -- | down | sw1 | -- | -- | -- |
| fc1/3 | 1 | FX | -- | down | sw1 | -- | -- | -- |
| fc1/4 | 1 | FX | -- | down | sw1 | -- | -- | -- |
| fc1/5 | 1 | FX | -- | down | sw1 | -- | -- | -- |
| fc1/6 | 1 | FX | -- | down | sw1 | -- | -- | -- |
| fc1/7 | 12 | auto | on | trunking | sw1 | TE | 2 | 24 |
| fc1/8 | 1 | FX | -- | down | sw1 | -- | -- | -- |
| fc1/9 | 12 | auto | on | trunking | sw1 | TE | 2 | 28 |
| fc1/10 | 1 | FX | -- | down | sw1 | -- | -- | -- |
| fc1/11 | 1 | FX | -- | down | sw1 | -- | -- | -- |
| fc1/12 | 1 | FX | -- | down | sw1 | -- | -- | -- |
| fc1/13 | 1 | FX | -- | down | sw1 | -- | -- | -- |
| fc1/14 | 1 | FX | -- | down | sw1 | -- | -- | -- |
| fc1/15 | 1 | FX | -- | down | sw1 | -- | -- | -- |
| fc1/16 | 1 | FX | -- | down | sw1 | -- | -- | -- |
| fc1/17 | 1 | FX | -- | down | sw1 | -- | -- | -- |
| fc1/18 | 1 | FX | -- | down | sw1 | -- | -- | -- |


```

fc1/19      1      FX      --      down      swl      --      --
fc1/20      1      FX      --      down      swl      --      --
fc1/21      13     auto   on      trunking  swl      TE      2      25
fc1/22      1      FX      --      down      swl      --      --
fc1/23      1      FX      --      down      swl      --      --
fc1/24      1      FX      --      down      swl      --      --
fc2/1       8      auto   on      trunking  swl      TE      4      30
fc2/2       1      FX      --      down      swl      --      --
fc2/3       1      FX      --      down      swl      --      --
fc2/4       1      FX      --      down      swl      --      --
fc2/5       1      FX      --      down      swl      --      --
fc2/6       1      FX      --      down      swl      --      --
fc2/7       12     auto   on      trunking  swl      TE      2      26
fc2/8       1      FX      --      down      swl      --      --
fc2/9       1      FX      --      down      swl      --      --
fc2/10      1      FX      --      down      swl      --      --
fc2/11      1      FX      --      down      swl      --      --
fc2/12      1      FX      --      down      swl      --      --
fc2/13      13     auto   on      trunking  swl      TE      2      29
fc2/14      1      FX      --      down      swl      --      --
fc2/15      1      FX      --      down      swl      --      --
fc2/16      1      FX      --      down      swl      --      --
fc2/17      1      FX      --      down      swl      --      --
fc2/18      1      FX      --      down      swl      --      --
fc2/19      13     auto   on      trunking  swl      TE      2      27
fc2/20      1      FX      --      down      swl      --      --
fc2/21      1      FX      --      down      swl      --      --
fc2/22      1      FX      --      down      swl      --      --
fc2/23      1      FX      --      down      swl      --      --
fc2/24      1      FX      --      down      swl      --      --
fc3/1       8      auto   on      down      swl      --      30
fc3/2       9      FX      --      down      swl      --      --
fc3/3       1      FX      --      down      swl      --      --
fc3/4       1      FX      --      down      swl      --      --
fc3/5       1      FX      --      down      swl      --      --
fc3/6       1      FX      --      down      swl      --      --
fc3/7       12     auto   on      trunking  swl      TE      2      28
fc3/8       1      FX      --      down      swl      --      --
fc3/9       1      FX      --      down      swl      --      --

```

```

9513B(config-if)# exit
9513B(config)# interface fc3/1
9513B(config-if)# no shut
9513B(config-if)# do show interface brief

```

| Interface | Vsan | Admin Mode | Admin Trunk Mode | Status | SFP | Oper Mode | Oper Speed (Gbps) | Port Channel |
|-----------|------|------------|------------------|----------|-----|-----------|-------------------|--------------|
| fc1/1 | 8 | auto | on | trunking | swl | TE | 4 | 30 |
| fc1/2 | 1 | FX | -- | down | swl | -- | -- | -- |
| fc1/3 | 1 | FX | -- | down | swl | -- | -- | -- |
| fc1/4 | 1 | FX | -- | down | swl | -- | -- | -- |
| fc1/5 | 1 | FX | -- | down | swl | -- | -- | -- |
| fc1/6 | 1 | FX | -- | down | swl | -- | -- | -- |
| fc1/7 | 12 | auto | on | trunking | swl | TE | 2 | 24 |
| fc1/8 | 1 | FX | -- | down | swl | -- | -- | -- |
| fc1/9 | 12 | auto | on | trunking | swl | TE | 2 | 28 |
| fc1/10 | 1 | FX | -- | down | swl | -- | -- | -- |
| fc1/11 | 1 | FX | -- | down | swl | -- | -- | -- |
| fc1/12 | 1 | FX | -- | down | swl | -- | -- | -- |
| fc1/13 | 1 | FX | -- | down | swl | -- | -- | -- |
| fc1/14 | 1 | FX | -- | down | swl | -- | -- | -- |
| fc1/15 | 1 | FX | -- | down | swl | -- | -- | -- |
| fc1/16 | 1 | FX | -- | down | swl | -- | -- | -- |
| fc1/17 | 1 | FX | -- | down | swl | -- | -- | -- |
| fc1/18 | 1 | FX | -- | down | swl | -- | -- | -- |
| fc1/19 | 1 | FX | -- | down | swl | -- | -- | -- |
| fc1/20 | 1 | FX | -- | down | swl | -- | -- | -- |
| fc1/21 | 13 | auto | on | trunking | swl | TE | 2 | 25 |
| fc1/22 | 1 | FX | -- | down | swl | -- | -- | -- |
| fc1/23 | 1 | FX | -- | down | swl | -- | -- | -- |
| fc1/24 | 1 | FX | -- | down | swl | -- | -- | -- |
| fc2/1 | 8 | auto | on | trunking | swl | TE | 4 | 30 |
| fc2/2 | 1 | FX | -- | down | swl | -- | -- | -- |
| fc2/3 | 1 | FX | -- | down | swl | -- | -- | -- |
| fc2/4 | 1 | FX | -- | down | swl | -- | -- | -- |

```

fc2/5      1      FX      --      down      swl      --      --
fc2/6      1      FX      --      down      swl      --      --
fc2/7      12     auto    on      trunking  swl      TE      2      26
fc2/8      1      FX      --      down      swl      --      --
fc2/9      1      FX      --      down      swl      --      --
fc2/10     1      FX      --      down      swl      --      --
fc2/11     1      FX      --      down      swl      --      --
fc2/12     1      FX      --      down      swl      --      --
fc2/13     13     auto    on      trunking  swl      TE      2      29
fc2/14     1      FX      --      down      swl      --      --
fc2/15     1      FX      --      down      swl      --      --
fc2/16     1      FX      --      down      swl      --      --
fc2/17     1      FX      --      down      swl      --      --
fc2/18     1      FX      --      down      swl      --      --
fc2/19     13     auto    on      trunking  swl      TE      2      27
fc2/20     1      FX      --      down      swl      --      --
fc2/21     1      FX      --      down      swl      --      --
fc2/22     1      FX      --      down      swl      --      --
fc2/23     1      FX      --      down      swl      --      --
fc2/24     1      FX      --      down      swl      --      --
fc3/1      8      auto    on      trunking  swl      TE      4      30
fc3/2      9      FX      --      down      swl      --      --
fc3/3      1      FX      --      down      swl      --      --
fc3/4      1      FX      --      down      swl      --      --
fc3/5      1      FX      --      down      swl      --      --
fc3/6      1      FX      --      down      swl      --      --
fc3/7      12     auto    on      trunking  swl      TE      2      28
fc3/8      1      FX      --      down      swl      --      --
fc3/9      1      FX      --      down      swl      --      --
9513B(config-if)# exit
9513B(config)# interface fc4/1
9513B(config-if)# no shut
9513B(config-if)# do show interface brief

```

| Interface | Vsan | Admin Mode | Admin Trunk Mode | Status | SFP | Oper Mode | Oper Speed (Gbps) | Port Channel |
|-----------|------|------------|------------------|----------|-----|-----------|-------------------|--------------|
| fc1/1 | 8 | auto | on | trunking | swl | TE | 4 | 30 |
| fc1/2 | 1 | FX | -- | down | swl | -- | | -- |
| fc1/3 | 1 | FX | -- | down | swl | -- | | -- |
| fc1/4 | 1 | FX | -- | down | swl | -- | | -- |
| fc1/5 | 1 | FX | -- | down | swl | -- | | -- |
| fc1/6 | 1 | FX | -- | down | swl | -- | | -- |
| fc1/7 | 12 | auto | on | trunking | swl | TE | 2 | 24 |
| fc1/8 | 1 | FX | -- | down | swl | -- | | -- |
| fc1/9 | 12 | auto | on | trunking | swl | TE | 2 | 28 |
| fc1/10 | 1 | FX | -- | down | swl | -- | | -- |
| fc1/11 | 1 | FX | -- | down | swl | -- | | -- |
| fc1/12 | 1 | FX | -- | down | swl | -- | | -- |
| fc1/13 | 1 | FX | -- | down | swl | -- | | -- |
| fc1/14 | 1 | FX | -- | down | swl | -- | | -- |
| fc1/15 | 1 | FX | -- | down | swl | -- | | -- |
| fc1/16 | 1 | FX | -- | down | swl | -- | | -- |
| fc1/17 | 1 | FX | -- | down | swl | -- | | -- |
| fc1/18 | 1 | FX | -- | down | swl | -- | | -- |
| fc1/19 | 1 | FX | -- | down | swl | -- | | -- |
| fc1/20 | 1 | FX | -- | down | swl | -- | | -- |
| fc1/21 | 13 | auto | on | trunking | swl | TE | 2 | 25 |
| fc1/22 | 1 | FX | -- | down | swl | -- | | -- |
| fc1/23 | 1 | FX | -- | down | swl | -- | | -- |
| fc1/24 | 1 | FX | -- | down | swl | -- | | -- |
| fc2/1 | 8 | auto | on | trunking | swl | TE | 4 | 30 |
| fc2/2 | 1 | FX | -- | down | swl | -- | | -- |
| fc2/3 | 1 | FX | -- | down | swl | -- | | -- |
| fc2/4 | 1 | FX | -- | down | swl | -- | | -- |
| fc2/5 | 1 | FX | -- | down | swl | -- | | -- |
| fc2/6 | 1 | FX | -- | down | swl | -- | | -- |
| fc2/7 | 12 | auto | on | trunking | swl | TE | 2 | 26 |
| fc2/8 | 1 | FX | -- | down | swl | -- | | -- |
| fc2/9 | 1 | FX | -- | down | swl | -- | | -- |
| fc2/10 | 1 | FX | -- | down | swl | -- | | -- |
| fc2/11 | 1 | FX | -- | down | swl | -- | | -- |
| fc2/12 | 1 | FX | -- | down | swl | -- | | -- |
| fc2/13 | 13 | auto | on | trunking | swl | TE | 2 | 29 |
| fc2/14 | 1 | FX | -- | down | swl | -- | | -- |

| | | | | | | | |
|--------|----|------|----|----------|-----|----|------|
| fc2/15 | 1 | FX | -- | down | swl | -- | -- |
| fc2/16 | 1 | FX | -- | down | swl | -- | -- |
| fc2/17 | 1 | FX | -- | down | swl | -- | -- |
| fc2/18 | 1 | FX | -- | down | swl | -- | -- |
| fc2/19 | 13 | auto | on | trunking | swl | TE | 2 27 |
| fc2/20 | 1 | FX | -- | down | swl | -- | -- |
| fc2/21 | 1 | FX | -- | down | swl | -- | -- |
| fc2/22 | 1 | FX | -- | down | swl | -- | -- |
| fc2/23 | 1 | FX | -- | down | swl | -- | -- |
| fc2/24 | 1 | FX | -- | down | swl | -- | -- |
| fc3/1 | 8 | auto | on | trunking | swl | TE | 4 30 |
| fc3/2 | 9 | FX | -- | down | swl | -- | -- |
| fc3/3 | 1 | FX | -- | down | swl | -- | -- |
| fc3/4 | 1 | FX | -- | down | swl | -- | -- |
| fc3/5 | 1 | FX | -- | down | swl | -- | -- |
| fc3/6 | 1 | FX | -- | down | swl | -- | -- |
| fc3/7 | 12 | auto | on | trunking | swl | TE | 2 28 |
| fc3/8 | 1 | FX | -- | down | swl | -- | -- |
| fc3/9 | 1 | FX | -- | down | swl | -- | -- |
| fc3/10 | 1 | FX | -- | down | swl | -- | -- |
| fc3/11 | 1 | FX | -- | down | swl | -- | -- |
| fc3/12 | 1 | FX | -- | down | swl | -- | -- |
| fc3/13 | 13 | auto | on | trunking | swl | TE | 2 27 |
| fc3/14 | 1 | FX | -- | down | swl | -- | -- |
| fc3/15 | 1 | FX | -- | down | swl | -- | -- |
| fc3/16 | 1 | FX | -- | down | swl | -- | -- |
| fc3/17 | 1 | FX | -- | down | swl | -- | -- |
| fc3/18 | 1 | FX | -- | down | swl | -- | -- |
| fc3/19 | 1 | FX | -- | down | swl | -- | -- |
| fc3/20 | 1 | FX | -- | down | swl | -- | -- |
| fc3/21 | 13 | auto | on | trunking | swl | TE | 2 29 |
| fc3/22 | 1 | FX | -- | down | swl | -- | -- |
| fc3/23 | 1 | FX | -- | down | swl | -- | -- |
| fc3/24 | 1 | FX | -- | down | swl | -- | -- |
| fc4/1 | 8 | auto | on | trunking | swl | TE | 4 30 |
| fc4/2 | 8 | FX | -- | down | swl | -- | -- |
| fc4/3 | 1 | FX | -- | down | swl | -- | -- |
| fc4/4 | 1 | FX | -- | down | swl | -- | -- |
| fc4/5 | 1 | FX | -- | down | swl | -- | -- |
| fc4/6 | 1 | FX | -- | down | swl | -- | -- |
| fc4/7 | 1 | FX | -- | down | swl | -- | -- |
| fc4/8 | 1 | FX | -- | down | swl | -- | -- |
| fc4/9 | 12 | auto | on | trunking | swl | TE | 2 26 |
| fc4/10 | 1 | FX | -- | down | swl | -- | -- |
| fc4/11 | 1 | FX | -- | down | swl | -- | -- |
| fc4/12 | 1 | FX | -- | down | swl | -- | -- |
| fc4/13 | 13 | auto | on | trunking | swl | TE | 2 25 |
| fc4/14 | 1 | FX | -- | down | swl | -- | -- |
| fc4/15 | 1 | FX | -- | down | swl | -- | -- |
| fc4/16 | 1 | FX | -- | down | swl | -- | -- |
| fc4/17 | 1 | FX | -- | down | swl | -- | -- |
| fc4/18 | 1 | FX | -- | down | swl | -- | -- |
| fc4/19 | 12 | auto | on | trunking | swl | TE | 2 24 |
| fc4/20 | 1 | FX | -- | down | swl | -- | -- |
| fc4/21 | 1 | FX | -- | down | swl | -- | -- |
| fc4/22 | 1 | FX | -- | down | swl | -- | -- |
| fc4/23 | 1 | FX | -- | down | swl | -- | -- |
| fc4/24 | 1 | FX | -- | down | swl | -- | -- |

| Interface | Status | Speed (Gbps) |
|-----------|--------|--------------|
| sup-fc0 | up | 1 |

| Interface | Status | IP Address | Speed | MTU |
|-----------|--------|----------------|--------|------|
| mgmt0 | up | 10.196.8.14/22 | 1 Gbps | 1500 |

| Interface | Vsan | Admin Trunk Mode | Status | Oper Mode | Oper Speed (Gbps) | IP Address |
|-----------------|------|------------------|----------|-----------|-------------------|------------|
| port-channel 24 | 12 | on | trunking | TE | 4 | -- |
| port-channel 25 | 13 | on | trunking | TE | 4 | -- |

```

port-channel 26      12    on    trunking    TE    4    --
port-channel 27      13    on    trunking    TE    4    --
port-channel 28      12    on    trunking    TE    4    --
port-channel 29      13    on    trunking    TE    4    --
port-channel 30      8     on    trunking    TE    16   --
9513B(config-if)# end
9513B# show interface port-channel 30
port-channel 30 is trunking
  Hardware is Fibre Channel
  Port WWN is 24:1e:00:0d:ec:e0:f9:40
  Admin port mode is auto, trunk mode is on
  snmp link state traps are enabled
  Port mode is TE
  Port vsan is 8
  Speed is 16 Gbps
  Trunk vsans (admin allowed and active) (8-9)
  Trunk vsans (up) (8-9)
  Trunk vsans (isolated) ( )
  Trunk vsans (initializing) ( )
  5 minutes input rate 3760 bits/sec, 470 bytes/sec, 2 frames/sec
  5 minutes output rate 2376 bits/sec, 297 bytes/sec, 2 frames/sec
  945 frames input, 165292 bytes
    0 discards, 0 errors
    0 CRC, 0 unknown class
    0 too long, 0 too short
  936 frames output, 108052 bytes
    0 discards, 0 errors
  1 input OLS, 4 LRR, 0 NOS, 35 loop inits
  4 output OLS, 5 LRR, 0 NOS, 9 loop inits
Member[1] : fc1/1
Member[2] : fc2/1
Member[3] : fc3/1
Member[4] : fc4/1
Interface last changed at Mon Nov 22 06:13:19 2010

```

test and profit

Now you're looking good! And so's the configuration. Performing a **show fcdomain domain-list** will give you an output of the Domain IDs and VSANs visible to the switch at each site.

```

9513A# show fcdomain domain-list

VSAN 1
Number of domains: 1
Domain ID          WWN
-----
0xba(186)         20:01:00:0d:ec:5a:fa:81 [Local] [Principal]

VSAN 2
Number of domains: 15
Domain ID          WWN
-----
0xc0(192)         20:02:00:0d:ec:5a:fa:81 [Local] [Principal]
0xa6(166)         20:02:00:0d:ec:11:8d:01
0x6a(106)         20:02:00:05:9b:7d:63:81
0x6c(108)         20:02:00:05:9b:7d:65:01
  0x56(86)         20:02:00:0d:ec:6f:75:81
  0x3b(59)         20:02:00:0d:ec:74:46:c1
0x7b(123)         20:02:00:0d:ec:ae:c7:81
  0x03(3)          20:02:00:0d:ec:6b:c6:01
0x74(116)         20:02:00:0d:ec:6f:72:01
0x65(101)         20:02:00:05:9b:7d:69:01
0xda(218)         20:02:00:0d:ec:bb:77:01
  0x46(70)         20:02:00:05:9b:7a:4c:41
  0x48(72)         20:02:00:05:9b:7a:da:01
  0x4a(74)         20:02:00:05:9b:21:2c:41
  0x4c(76)         20:02:00:05:9b:22:43:01

VSAN 3
Number of domains: 15
Domain ID          WWN
-----
  0x47(71)         20:03:00:05:9b:79:14:c1 [Principal]

```

```

0xca(202)    20:03:00:0d:ec:5a:fa:81 [Local]
0xa2(162)    20:03:00:0d:ec:11:8d:01
0x6b(107)    20:03:00:05:9b:7d:6c:81
0x6d(109)    20:03:00:05:9b:7d:66:01
0xc8(200)    20:03:00:0d:ec:6f:72:81
0x35(53)     20:03:00:0d:ec:97:f0:01
0x36(54)     20:03:00:0d:ec:6f:76:01
0x11(17)     20:03:00:0d:ec:6f:73:41
0x66(102)    20:03:00:05:9b:7d:6d:81
0x86(134)    20:03:00:0d:ec:6f:73:81
0x24(36)     20:03:00:0d:ec:bb:4f:01
0x4b(75)     20:03:00:05:9b:21:45:81
0x49(73)     20:03:00:05:9b:7a:27:81
0x4d(77)     20:03:00:05:9b:22:88:01

```

```

VSAN 8
Number of domains: 2
Domain ID          WWN
-----
0x0c(12)           20:08:00:0d:ec:5a:fa:81 [Local] [Principal]
0x0a(10)           20:08:00:0d:ec:e0:f9:41

```

```

VSAN 9
Number of domains: 2
Domain ID          WWN
-----
0x0d(13)           20:09:00:0d:ec:5a:fa:81 [Local] [Principal]
0x0b(11)           20:09:00:0d:ec:e0:f9:41
9513A#

```

9513B# **show fcdomain domain-list**

```

VSAN 1
Number of domains: 1
Domain ID          WWN
-----
0x7c(124)          20:01:00:0d:ec:e0:f9:41 [Local] [Principal]

```

```

VSAN 8
Number of domains: 2
Domain ID          WWN
-----
0x0c(12)           20:08:00:0d:ec:5a:fa:81 [Principal]
0x0a(10)           20:08:00:0d:ec:e0:f9:41 [Local]

```

```

VSAN 9
Number of domains: 2
Domain ID          WWN
-----
0x0d(13)           20:09:00:0d:ec:5a:fa:81 [Principal]
0x0b(11)           20:09:00:0d:ec:e0:f9:41 [Local]

```

```

VSAN 12
Number of domains: 4
Domain ID          WWN
-----
0xd4(212)          20:0c:00:0d:ec:e0:f9:41 [Local] [Principal]
0x3e(62)           20:0c:00:05:9b:7a:da:81
0x3c(60)           20:0c:00:05:9b:7a:d9:01
0x40(64)           20:0c:00:05:9b:7a:db:c1

```

```

VSAN 13
Number of domains: 4
Domain ID          WWN
-----
0xd5(213)          20:0d:00:0d:ec:e0:f9:41 [Local] [Principal]
0x3d(61)           20:0d:00:05:9b:79:14:41
0x3f(63)           20:0d:00:05:9b:7a:e3:c1
0x41(65)           20:0d:00:05:9b:7a:27:c1

```

If you have zoning traversing the link (in this case we don't), you could run the following commands for each VSAN you expect to be active on the switch.

```

9513A# show zoneset active vsan 2
zoneset name VSAN2_CFG vsan 2

```

```
zone name ESXHOST98_HBA0_CX4960_SPA0 vsan 2
* fcid 0xc004ef [pwwn 50:06:01:60:3b:20:36:c1] [CX4960_SPA0]
* fcid 0x561100 [pwwn 50:01:43:80:05:6a:18:d4] [ESXHOST98_HBA0]

zone name ESXHOST98_HBA0_CX4960_SPB2 vsan 2
* fcid 0xc007ef [pwwn 50:06:01:6a:3b:20:36:c1] [CX4960_SPB2]
* fcid 0x561100 [pwwn 50:01:43:80:05:6a:18:d4] [ESXHOST98_HBA0]
```

[snip]

And if you haven't done any zoning, or don't allow VSAN 2 to traverse the ISL, you'll see the following.

```
9513B# show zoneset active vsan 8
Zoneset not present
9513B# show zoneset active vsan 9
Zoneset not present
9513B# show zoneset active vsan 2
VSAN 2 is not configured
9513B#
```

conclusion

As stated previously, once you know how to do something, it's really easy. And that's how you should approach the creation of port-channels between sites.