What's New with ICLs for X7

- X7 Director ICL Kits use a stronger format

- Both X7-4 and X7-8 use same 8-port POD licenses
  - X7-8: maximum 4, ==minimum 1==
  - X7-4: maximum 2, minimum 1

- Only Secure Optics are supported in Gen 7 ICL kits
  - also required for X6 that has been upgrade to Gen 7

- https://docs.broadcom.com/doc/Scale-Out-ICLs-DG
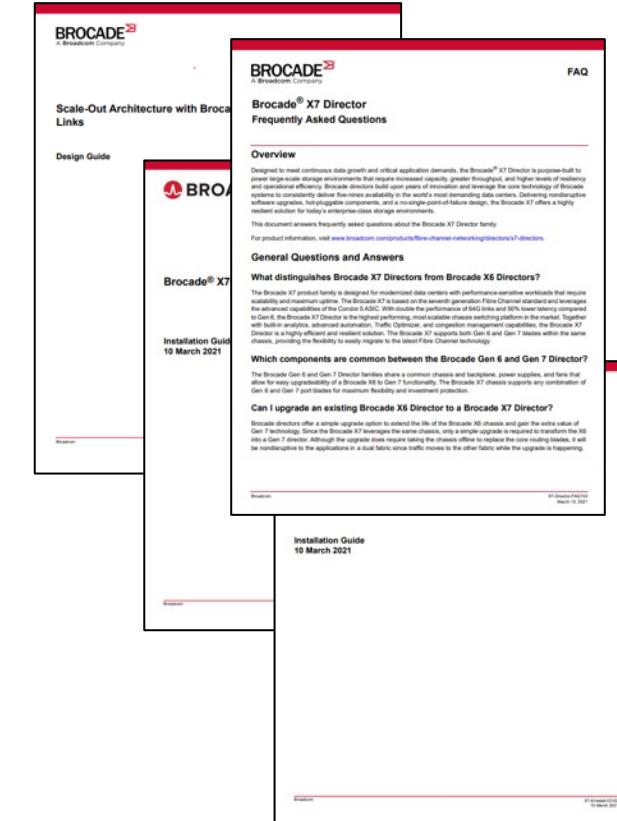
Connection	Gen 7 SWL 100m	Gen 7 LWL 2km	Gen 6 (32Gb/s) SWL 100m	Gen 6 (32Gb/s) LWL 2km	Gen 5 (16G) SWL 100m
X7 to X7	🟩	🟩	🟩	🟩	
X7 to X6+	🟩	🟩	🟩	🟩	
X7 to X6			🟩	🟩	
X7 to DCX 8510					🟩

BROADCOM®

For More Details, Check Out These Reference Documents

Updated with FOS 9.1.0

Updated September 6th, 2022

- [Scale-Out Architecture with Brocade® UltraScale Inter-Chassis Links](#)

- [Brocade Transceiver Support Matrix](#)

- [Brocade X7-4 Director Hardware Installation Guide](#)

- [Brocade X7-8 Director Hardware Installation Guide](#)

- [Brocade X7 Director Frequently Asked Questions](#)

BROADCOM®

Gen 7 ICL POD Kits and Optics Overview

BROADCOM®

X7 ICL POD kits Overview

Item	SKU	Description
ICL POD Kits	BR-X7ICLKIT-100M-01	X7 100m ICL POD Kit, includes 8-port license + 8 x Gen 7 ICL QSFPs
	BR-X7ICLKIT-2KM-01	X7 2km Gen 7 ICL POD Kit, includes 8-port license + 8 x 2KM Gen 7 ICL QSFPs
	BR-X7Gen 6ICLKIT-100M-01	X7 100m 32G ICL Kit, includes 8-port license + 8 x 4X32G QSFPs
	BR-X7Gen 6ICLKIT-2KM-01	X7 2km 32G ICL POD Kit, includes 8-port license + 8 x 2KM 4X32G QSFPs End of availability, cannot be ordered anymore, but still supported

- Same 8-port license is used for all SKUs – only the QSFP optics are different

- Consolidated ICL kit offerings used in both X7-8 and X7-4 chassis
  - two Gen 7-compatible and two Gen 6-compatible offerings

- Secure Optics are required in Gen 7 ICL kits!
  - also required for X6 that has been upgrade to Gen 7
  - X7 uses same 2 km 32G optic as X6

BROADCOM®

X7 ICL Variants

100m (Multimode)

Gen 7 100m ICL Kit
- Gen 7 secure QSFP
- P/N BR-X7ICLKIT-100M-01
- XBR-000420 (no breakout)
- X7-X7 (Gen 7 speed only)

optional: Gen 6 100m ICL Kit for X7
- Gen 6 secure QSFP (4x32Gb/s)
- P/N BR-X7GEN6ICLKIT-100M-01
- XBR-000475 (breakout support)
- X7-X7 (32Gb/s)

Brocade GEN7

X7 — X7

Gen 7 100m ICL Kit
- Gen 7 secure QSFP
- P/N BR-X7ICLKIT-100M-01
- XBR-000420 (no breakout)
- X7-X7 (Gen 7 speed only)
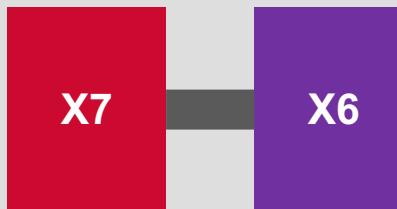
optional: Gen 6 100m ICL Kit for X7
- Gen 6 secure QSFP (4x32Gb/s)
- P/N BR-X7GEN6ICLKIT-100M-01
- XBR-000475 (breakout support)
- X7-X7 (32Gb/s)

Brocade GEN7

Gen 6 100m ICL Kit for X7
- Gen 6 secure QSFP (4x32Gb/s)
- P/N BR-X7GEN6ICLKIT-100M-01
- XBR-000475 (breakout support)
- X7-X6 (32Gb/s)
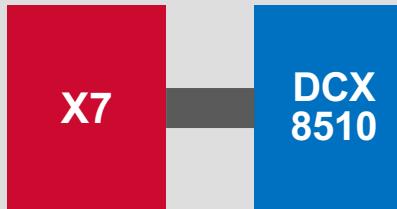
Brocade GEN7

X7 — X6

Gen 6 100m ICL Kit for X6
- Gen 6 non-/secure QSFP (4x32Gb/s)
- P/N BR-X6xICLKIT-100m-02
- XBR-000275/475 (breakout support)
- X7-X6 (32Gb/s)

Brocade GEN6

Gen 6 100m ICL Kit for X7
- Gen 6 secure QSFP (4x32Gb/s)
- P/N BR-X7GEN6ICLKIT-100M-01
- XBR-000475 (breakout support)
- X7-8510 (16Gb/s)

Brocade GEN7

X7 — DCX 8510

Gen 5 100m ICL Kit for DCX8510
- Gen 5 QSFP (4x16Gb/s)
- P/N BR-8510ICLKIT-01
- XBR-000245 (breakout support)
- X7-8510 (16Gb/s)

Brocade GEN5

BROADCOM

X7 ICL Variants

2km (Singlemode)

*supported, but End of availability, cannot be ordered anymore
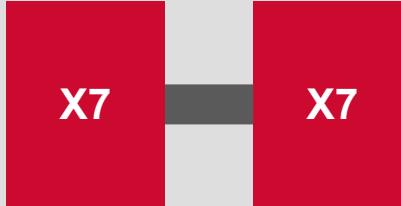
Brocade GEN7

Gen 7 2km ICL Kit for X7
- Gen 7 secure QSFP
- P/N BR-X7ICLKIT-2KM-01
- XBR-000476 (no breakout)
- X7-X7 only (no 16/32Gb/s)

*Optional Gen 6 2km ICL Kit for X7
- Gen 6 QSFP (4x32Gb/s)
- P/N BR-X7GEN6ICLKIT-2KM-01
- XBR-000285 (no breakout)
- X7-X7 (32Gb/s)

X7 — X7

Gen 7 2km ICL Kit for X7
- Gen 7 secure QSFP
- P/N BR-X7ICLKIT-2KM-01
- XBR-000476 (no breakout)
- X7-X7 only (no 16/32Gb/s)
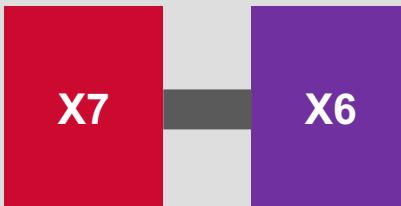
***Optional Gen 6 2km ICL Kit for X7**
- Gen 6 QSFP (4x32Gb/s)
- P/N BR-X7GEN6ICLKIT-2KM-01
- XBR-000285 (no breakout)
- X7-X7 (32Gb/s)

Brocade GEN7

Brocade GEN7

*Gen 6 2km ICL Kit for X7
- Gen 6 QSFP (4x32Gb/s)
- FOS 9.0.1a or later
- P/N BR-X7GEN6ICLKIT-2KM-01
- XBR-000285 (no breakout)
- X7-X6 (32Gb/s)
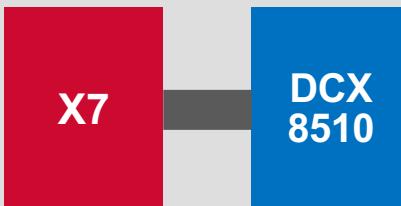
X7 — X6

*Gen 6 2km ICL Kit for X6
- Gen 6 QSFP (4x32Gb/s)
- P/N BR-X6xICLKIT-2KM-01
- XBR-000285 (no breakout)
- X7-X6 (32Gb/s)

Brocade GEN6

Brocade GEN7

Not available

X7 — DCX 8510
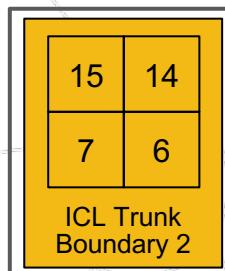
Not available

Brocade GEN5

BROADCOM®
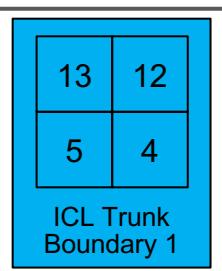
ICL Matrix Gen 7 - X7
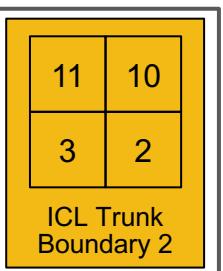
X7	SWL/LWL	Product	Licenses per chassis	QSFP Ports per Chassis per license (Core Blade = 1/2)	FC Ports per Chassis per license (Core Blade = 1/2)	QSFPs included per Kit	Connector	Connectivity	Distance
Gen 7 100m ICL kit (P/N BR-X7ICLKIT-100M-01): X7 ICL POD KIT, enables 8 ICL ports, 8x GEN 7 ICL QSFPS 100m Optics: XBR-000420 (**no** breakout)	SWL	X7-4	1 or 2	8 or 16	32 or 64	8	MTP	X7 - X7 (Gen 7 speed only)	OM3 70m OM4 100m
		X7-8	1, 2, 3 or 4	8, 16, 24 or 32	32, 64, 96 or 128				
Gen 7 2-km ICL kit (P/N BR-X7ICLKIT-2KM-01): X7 ICL POD KIT, enables 8 ICL ports, 8x GEN 7 ICL QSFPS 2km Optics: XBR-000476 (**no** breakout)	LWL	X7-4	1 or 2	8 or 16	32 or 64	8	LC	X7 - X7 (Gen 7 speed only)	2 km
		X7-8	1, 2, 3 or 4	8, 16, 24 or 32	32, 64, 96 or 128				
Gen 6 100m ICL kit for the X7 chassis (P/N BR-X7GEN6ICLKIT-100M-1): X7 32G ICL POD KIT, enables 8 ICL ports, 8x 32G QSFPS 100m Optics: XBR-000475 (breakout supported)	SWL	X7-4	1 or 2	8 or 16	32 or 64	8	MTP	X7 - X7 (32Gb/s) X7 - X6 (32Gb/s) X7 – DCX 8510 (16Gb/s)	OM3 70m OM4 100m
		X7-8	1, 2, 3 or 4	8, 16, 24 or 32	32, 64, 96 or 128				
Gen 6 2-km ICL kit for the X7 chassis (P/N BR-X7GEN6ICLKIT-2KM-01): X7 32G ICL POD KIT, enables 8 ICL ports, 8x 32G QSFP 2km Optics: XBR-000285 (**no** breakout) **Note**: The Gen 6 2-km ICL POD kit is no longer available to order.	LWL	X7-4	1 or 2	8 or 16	32 or 64	8	LC	X7 - X7 (32Gb/s) X7 - X6 (32Gb/s)	2 km
		X7-8	1, 2, 3 or 4	8, 16, 24 or 32	32, 64, 96 or 128				

X7-8

15	14
7	6

ICL Trunk Boundary 2
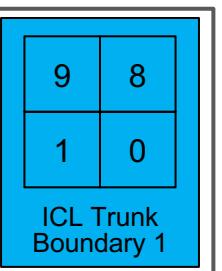
ICLPOD4 enables ICL Port 6,7,14,15

13	12
5	4

ICL Trunk Boundary 1
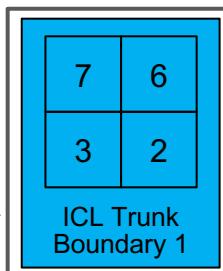
ICLPOD3 enables ICL Port 4,5,12,13
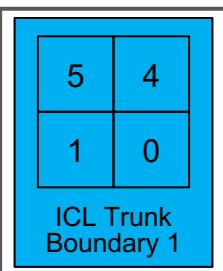
11	10
3	2

ICL Trunk Boundary 2

ICLPOD2 enables ICL Port 2,3,10,11

9	8
1	0

ICL Trunk Boundary 1

ICLPOD1 enables ICL Port 0,1,8,9

Ports shown on single CR Blade

X7-4

7	6
3	2

ICL Trunk Boundary 1

ICLPOD2 enables ICL Port 2,3,6,7

5	4
1	0

ICL Trunk Boundary 1

ICLPOD1 enables ICL Port 0,1,4,5

BROADCOM®

Brocade SFP Support Matrix

https://docs.broadcom.com/doc/GA-MX-460

⚠ Rev. v19 2023-08
Check always for...

updated or new

Category	Description	Manufacturing Part Number	Brocade Ordering Part Number	Gen 7 Brocade X7	Brocade FC64-64	Brocade FC64-48	Brocade FC32-X7-48	Brocade G730	Brocade G720	Gen 6 Brocade X6	Brocade FC32-64	Brocade FC32-48	Brocade G630	Brocade G620	Brocade G610
64G FC SFP+	SWL	57-1000495-01	XBR-000462 (1-pack) XBR-000463 (8-pack)	●	●[1]			●	●[1]						
	LWL - 10 km	57-1000496-01	XBR-000468 (1-pack) XBR-000469 (8-pack)	●	●[2]			●[2]	●[2]						
	ELWL - 25 km	57-1000497-01	XBR-000466 (1-pack)		●[2]			●[2]	●[2]						
64G FC SFP-DD	SWL	57-1000505-01	XBR-000464 (1-pack) XBR-000465 (8-pack)	●				●	●[3]						
Gen 7 FC QSFP+	SWL	57-1000481-01	XBR-000420 (1-pack)	●											
	2 km	57-1000506-01	XBR-000476 (1-pack)	●[3]											
32G FC SFP+	SWL	57-1000333-01	XBR-000212 (1-pack) XBR-000213 (8-pack)									●	●	●	●
	SWL	57-1000485-01	XBR-000412 (1-pack) XBR-000413 (8-pack)		●	●	●	●				●	●	●	●
	LWL - 10 km	57-1000332-01	XBR-000238 (1-pack) XBR-000239 (8-pack)									●	●	●	●
	LWL - 10 km	57-1000486-01	XBR-000438 (1-pack) XBR-000439 (8-pack)	●	●	●	●	●				●	●	●	●
	ELWL - 25 km	57-1000335-01	XBR-000278 (1-pack)[4]									●	●	●	●
	ELWL - 25 km	57-1000494-01	XBR-000478 (1-pack)[4]		●[1]	●[1]	●	●[1]				●	●	●	●
	ELWL - 25 km	57-1000498-01	XBR-000479 (1-pack)[4,5]	●	●[2]	●[2]	●[2]	●[2]					●[2,6]	●[2,6]	
4x32G FC QSFP+	SWL	57-1000351-01	XBR-000275 (1-pack)[5]							●	●		●	●	
	SWL	57-1000490-01	XBR-000475 (1-pack)[5]	●						●	●		●	●	
	2 km	57-1000480-01	XBR-000285 (1-pack)	●[1]						●[7]	●[7]				
16G FC SFP+	SWL	57-0000088-01	XBR-000192 (1-pack) XBR-000193 (8-pack)									●	●	●	●
	SWL	57-1000487-01	XBR-000492 (1-pack) XBR-000493 (8-pack)				●					●	●	●	●
	LWL - 10 km	57-0000089-01	XBR-000198 (1-pack) XBR-000199 (8-pack)									●	●	●	●
	LWL - 10 km	57-1000488-01	XBR-000498 (1-pack) XBR-000499 (8-pack)				●					●	●	●	●
	ELWL - 25 km	57-1000262-01	XBR-000258 (1-pack)									●	●	●	●
	ELWL - 25 km	57-1000489-01	XBR-000458 (1-pack)				●					●	●	●	●
4x16G FC QSFP+	SWL	57-1000294-01/-02	XBR-000245 (1-pack)							●[8]	●[8]	●[8]		●[8]	
	SWL	57-1000267-01	XBR-000232 (1-pack)												
	2 km	57-1000310-01	XBR-000255 (1-pack)							●[9]					

1 Minimum FOS version is 9.0.1a

2 Minimum FOS version is 9.1.1.

3 Minimum FOS version is 9.1.0.

4 The XBR-000479 only supports the same optic on each end of the cable. It is not compatible with either the XBR-000278 or the XBR-000478.

5 Supports 32G/16G speeds only.

6 Compatible with the G620 Switch with switch type 183 and with the G630 Switch with switch type 184.

7 The 4x32G FC 2-km QSFP on X6 ICL ports requires FOS 8.1.0b or higher.

8 FC-compliant QSFPs are supported on ICLs (DCX 8510 and X6) and the FC16-64, FC32-64, G620, and G630.

9 ICL only. Not supported on the FC32-64.

BROADCOM®

ICL Considerations

(please always review latest manuals and documentation)

BROADCOM®
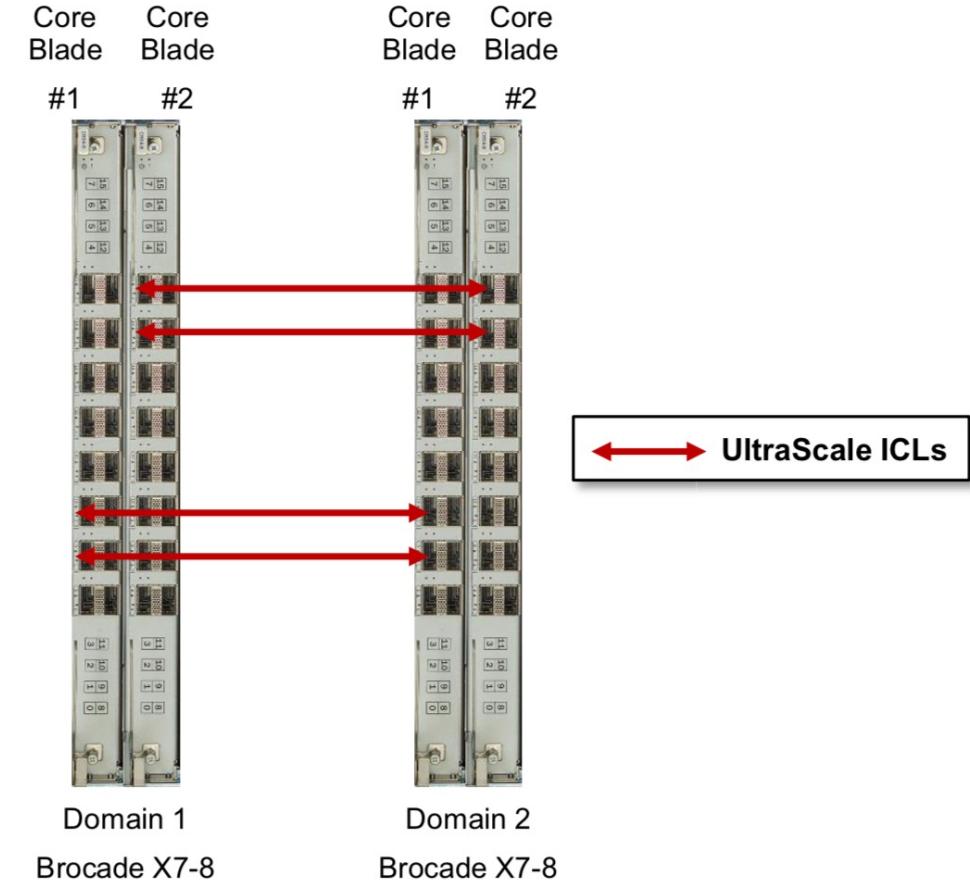
ICL Considerations (1)

Number of ICL ports between 2 chassis

- <mark>A minimum of 4 ICL ports</mark> (2 on each core blade) must be connected between each chassis pair
  - 32 UltraScale ICL ports on the 8-slot director support ICL connectivity with up to 8 other chassis
  - 16 UltraScale ICL ports on the 4-slot director support ICL connectivity with up to 4 other chassis

- <mark>A maximum of 16</mark> UltraScale ICL connections between any pair of director is supported
  - unless they are deployed using Virtual Fabrics, where a maximum of 16 UltraScale ICL connections or trunks can be assigned to a single logical switch
  - this limitation is due to the maximum number of supported connections for Fabric Shortest Path First (FSPF) routing

Figure 3: Minimum ICL Connections Needed Between a Pair of Chassis

BROADCOM®
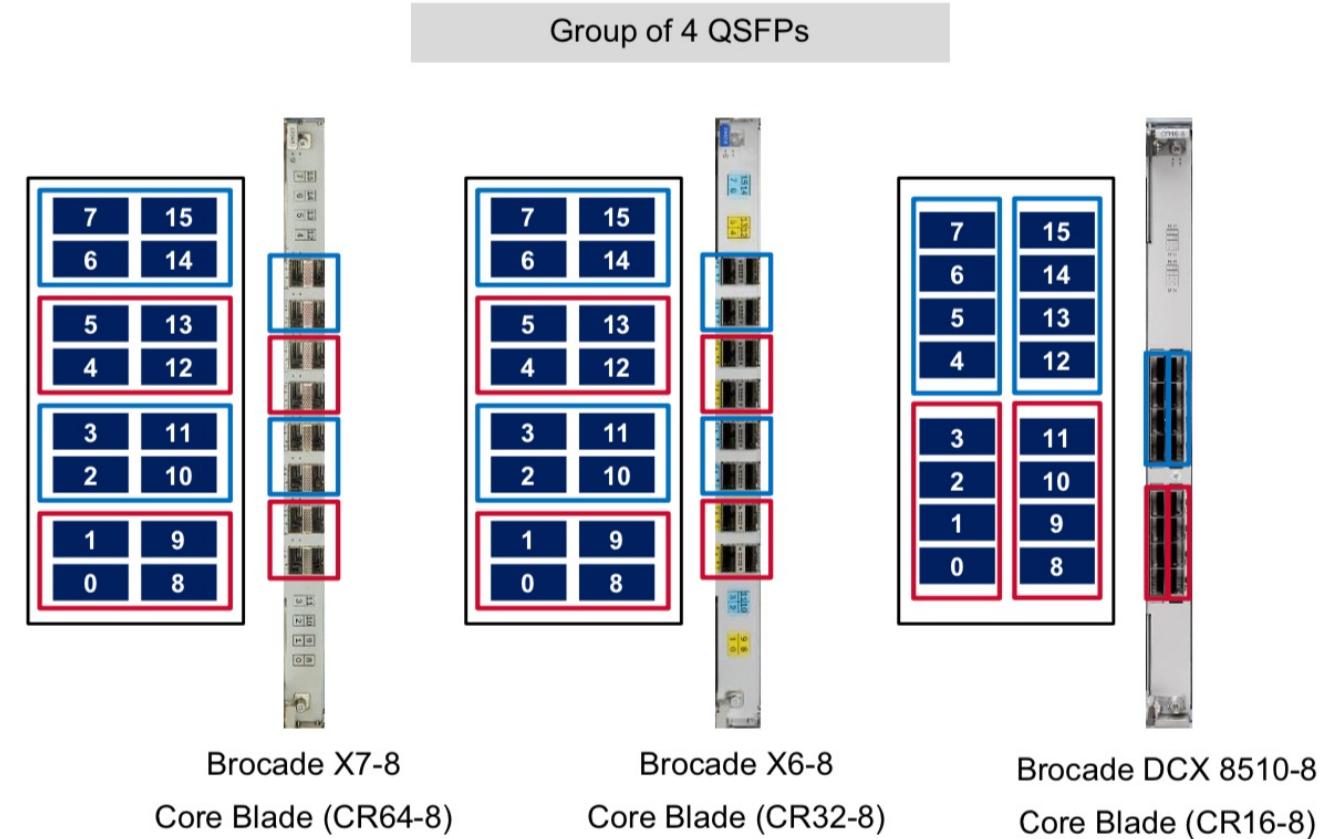
ICL Considerations (2)
Trunking

- The dual connections on each core blade must reside within the <mark>same UltraScale ICL trunk boundary</mark> on the core blades
  - If more than four UltraScale ICL connections are required between a pair of director chassis, additional UltraScale ICL connections <mark>must be added in pairs</mark> (1 on each core blade)

- Members of trunk boundaries are …
  - the <mark>same</mark> on the Brocade X7-8 and X6-8
  - <mark>different</mark> on the DCX 8510-8
  - the connectivity requirements and principles are the same between all three generations of products
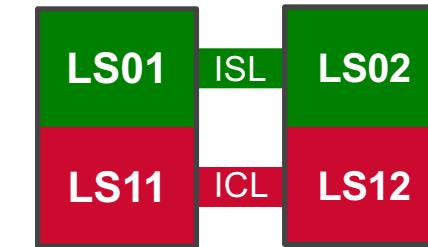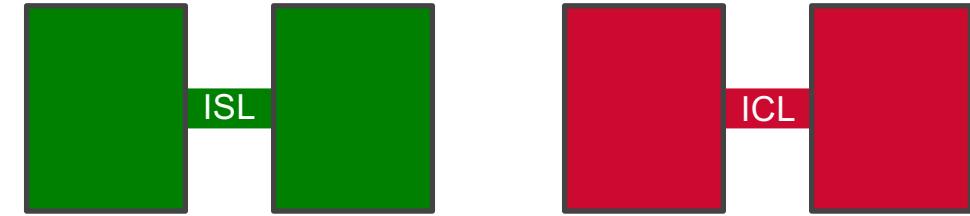
Figure 4: Core Blade Trunk Groups on an 8-Slot Director Core Blade

Group of 4 QSFPs

Brocade X7-8
Core Blade (CR64-8)

Brocade X6-8
Core Blade (CR32-8)

Brocade DCX 8510-8
Core Blade (CR16-8)

BROADCOM®

ICL Considerations (3)

ICL / ISL intermix

- **Combining** QSFP-based UltraScale ICLs and traditional ISLs **is not supported** between a single pair of directors

- All inter- chassis connectivity between any pair of director chassis must be done using **either ISLs or UltraScale ICLs** and **at the same speed** between any two directors
  - **Exception**: if Brocade Virtual Fabrics is enabled, simultaneous ICLs and ISLs can coexist between a pair of Brocade X7, X6, and/or Brocade DCX 8510 chassis if ICLs are in a different logical switch than the ISLs

- ICL ports cannot be used as ISL by connecting other switches/blades using the QSFP ports on these devices

BROADCOM®
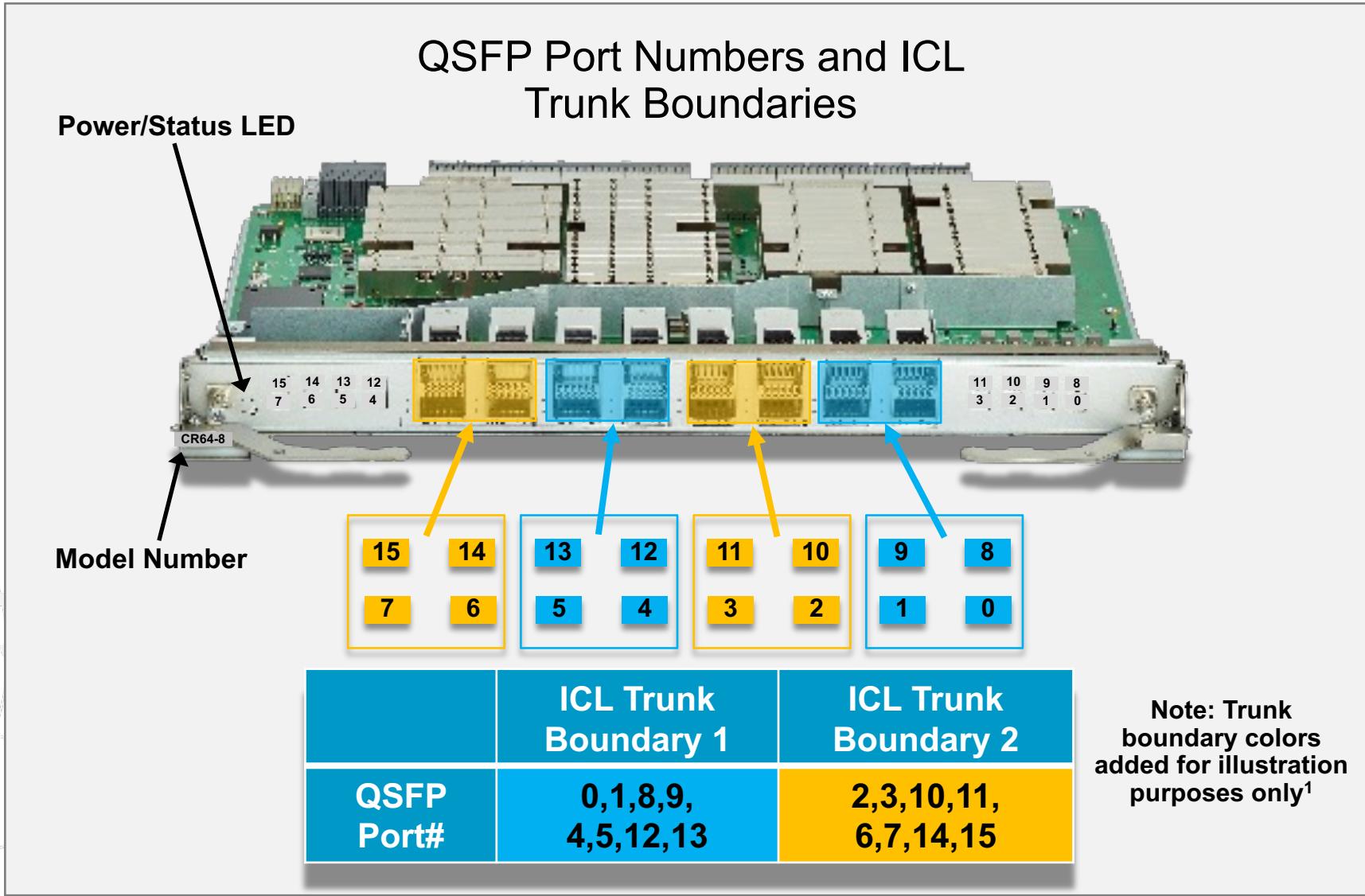
Gen 7 ICL Additional Details

BROADCOM®

CR64-8 Core Routing Blade for X7-8

Layout

QSFP Port Numbers and ICL Trunk Boundaries

Power/Status LED

Model Number

CR64-8

| 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 |
| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |

	ICL Trunk Boundary 1	ICL Trunk Boundary 2
QSFP Port#	0,1,8,9, 4,5,12,13	2,3,10,11, 6,7,14,15

Note: Trunk boundary colors added for illustration purposes only[1]

BROADCOM®

CR64-8 Core Routing Blade for X7-8

Layout

QSFP Port Numbers and ICL Trunk Boundaries (X7-8 Core Blade)

	ICL Trunk Boundary 1	ICL Trunk Boundary 2
QSFP Port#	0,1,8,9, 4,5,12,13	2,3,10,11, 6,7,14,15

Note: Trunk boundary colors added for illustration purposes only

BROADCOM®

CR64-4 Core Routing Blade for X7-4

Layout

QSFP Port Numbers and
ICL Trunk Boundaries

Power/Status LED

Model Number

	ICL Trunk Boundary 1
QSFP Port#	0,1,2,3,4,5,6,7

Note: Trunk boundary colors added for illustration purposes only[1]

BROADCOM®

Gen 6 ICL Overview

Gen 6 ICL connectivity
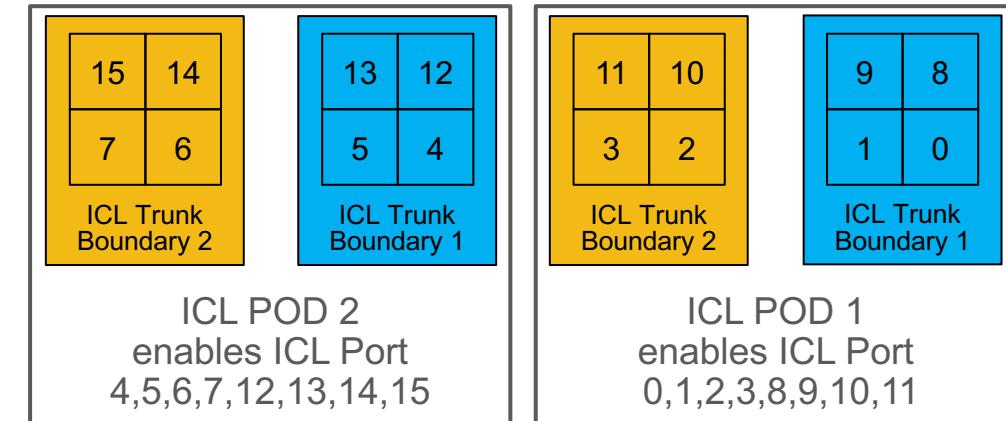
Requirements & recap of considerations

- A minimum of four ICL ports (two on each core blade) must be connected between each chassis pair.

- The dual connections on each core blade must reside within the same ICL trunk boundary on the core blades.

- If more than four ICL connections are required between a pair of Brocade DCX 8510 chassis, additional ICL connections should be added in pairs, with each additional pair residing within the same trunk boundary

- QSFP-based ICLs and traditional ISLs are not concurrently supported between a single pair of G6 chassis

- Gen 5 QSFPs (4x16G QSFPs) must be used on Gen 6 ICL Ports to connect to Gen 5 chassis via ICL port

BROADCOM®

ICL Matrix Gen 6 X6-8

X6-8	SWL/LWL	Product	Licenses per chassis	QSFP Ports per Chassis per license (Core Blade = 1/2)	FC Ports per Chassis per license (Core Blade = 1/2)	QSFPs included per Kit	Connector	Connectivity	Distance
Gen 6 100m 8-slot ICL kit (P/N BR-X68ICLKIT-100M-02): X6 32G ICL POD KIT, enables 16 ICL ports, 16x 32G QSFPS 100m Optics: XBR-000475, XBR-000275 (breakout supported)	SWL	X6-8	1 or 2	16 or 32	64 or 128	16	MTP	X6 - X6 (16/32 Gb/s) X6 - DCX 8510 (fix 16Gb/s)	OM3 70m OM4 100m
Gen 6 2-km 8-slot ICL kit (P/N BR-X68ICLKIT-2KM-01): X6 32G ICL POD KIT, enables 16 ICL ports, 8x 32G QSFPS 2km Optics: XBR-000285 (**no** breakout)	LWL	X6-8	1 or 2	16 or 32	64 or 128	8	LC	X6 - X6 (32 Gb/s)	2 Km
Gen 5 2-km 8-slot ICL kit for the X6-8 chassis (P/N BR-X68GEN5ICLKIT-2KM-01): X6 32G ICL POD KIT, enables 16 ICL ports, 8x 16G QSFPS 2km Optics: XBR-000255 (**no** breakout)	LWL	X6-8	1 or 2	16 or 32	64 or 128	8	MTP 3m pigtail APC	X6 - DCX 8510 (16Gb/s)	2 Km

X6-8

15	14
7	6

ICL Trunk Boundary 2

13	12
5	4

ICL Trunk Boundary 1

ICL POD 2
enables ICL Port
4,5,6,7,12,13,14,15

11	10
3	2

ICL Trunk Boundary 2

9	8
1	0

ICL Trunk Boundary 1

ICL POD 1
enables ICL Port
0,1,2,3,8,9,10,11

BROADCOM®
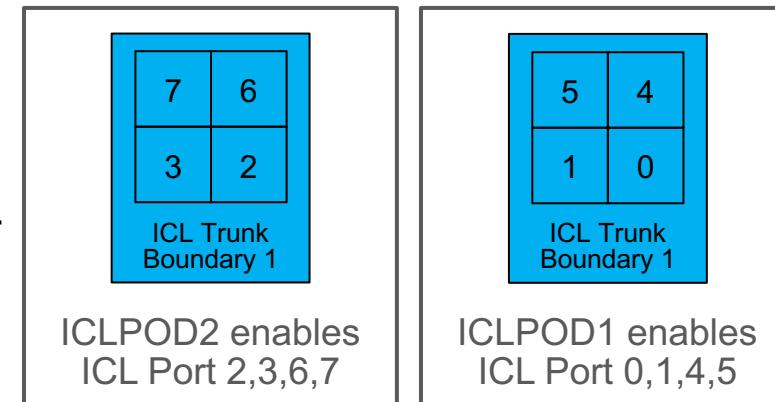
ICL Matrix Gen 6 X6-4

X6-4	SWL/LWL	Product	Licenses per chassis	QSFP Ports per Chassis per license (Core Blade = 1/2)	FC Ports per Chassis per license (Core Blade = 1/2)	QSFPs included per Kit	Connector	Connectivity	Distance
Gen 6 100m 4-slot ICL kit (P/N BR-X64ICLKIT-100M-02): X6 32G ICL POD KIT, enables 8 ICL ports, 16x 32G QSFPS 100m Optics: XBR-000475, XBR-000275 (breakout supported)	SWL	X6-4	1 or 2	8 or 16	32 or 64	8	MTP	X6 - X6 (16/32 Gb/s) X6 - DCX 8510 (fix 16Gb/s)	OM3 70m OM4 100m
Gen 6 2-km 4-slot ICL kit (P/N BR-X64ICLKIT-2KM-01): X6 32G ICL POD KIT, enables 8 ICL ports, 8x 32G QSFPS 2km Optics: XBR-000285 (**no** breakout)	LWL	X6-4	1 or 2	8 or 16	32 or 64	8	LC	X6 - X6 (32 Gb/s)	2 Km
Gen 5 2-km 4-slot ICL kit for the X6-4 chassis (P/N BR-X64GEN5ICLKIT-2KM-01): X6 32G ICL POD KIT, enables 8 ICL ports, 8x 16G QSFPS 2km Optics: XBR-000255 (**no** breakout)	LWL	X6-4	1 or 2	8 or 16	32 or 64	8	MTP 3m pigtail APC	X6 - DCX 8510 (16Gb/s)	2 Km

X7-4

7	6
3	2

ICL Trunk Boundary 1

5	4
1	0

ICL Trunk Boundary 1

ICLPOD2 enables ICL Port 2,3,6,7

ICLPOD1 enables ICL Port 0,1,4,5

BROADCOM®

ICL Matrix Gen 5 8510

DCX 8510			SWL/LWL	Product	Licenses per chassis	QSFP Ports per Chassis per license (Core Blade = 1/2)	FC Ports per Chassis per license (Core Blade = 1/2)	QSFPs included per Kit	Connector	Connectivity	Distance
Gen 5 100m ICL kit (P/N BR-8510ICLKIT-01): DCX 8510 16G ICL POD KIT, enables 16 ICL ports, 16x 16G QSFPS 100m Optics: XBR-000245			SWL	8510-4	1	16	64	16	MTP	DCX 8510 - DCX 8510 (16Gb/s)	OM3 70m OM4 100m
				8510-8	1 or 2	16 or 32	64 or 128				
Gen 5 2-km ICL kit (P/N BR-8510ICLKIT2KM-01): DCX 8510 16G ICL POD KIT, enables 16 ICL ports, 8x 16G QSFPS 2km Optics: XBR-000255 (no breakout)			LWL	8510-4	1	16	64	8	MTP 3m pigtail APC	DCX 8510 - DCX 8510 (16Gb/s)	2km
				8510-8	1 or 2	16 or 32	64 or 128				

TG#2   **TG#1**

ICL POD 2 on DCX8510-8, enables QSFP ports 8, 9, 10, 11, 12, 13, 14,15

| 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 |

ICL POD 1 on DCX8510-8, enables QSFP ports 0, 1, 2, 3, 4, 5, 6, 7

| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |

On the Brocade DCX8510-4, a single ICL POD license enables all 16 UltraScale ICL QSFP ports on the director

| 7 | 6 | 5 | 4 |
| 3 | 2 | 1 | 0 |

TG#2   **TG#1**

BROADCOM