CCNP Routing and Switching ROUTE 300-101 Official Cert Guide

First Edition

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When reviewing corrections, always check the print number of your book. Corrections are made to printed books with each subsequent printing.

First Printing: November 2014

Corrections for November 28, 2018

Pg	Error – seventh printing	Correction
269	In Table 7-3, the “Key Information” for the "show ip ospf interface brief” command ends with the text “, omitting passive interfaces”. Please remove that text from the “Key Information.” Reads: Lists the interfaces on which OSPF is enabled (based on the network commands), omitting passive interfaces	Should read: Lists the interfaces on which OSPF is enabled (based on the network commands)

Corrections for October 16, 2018

Pg	Error – seventh printing	Correction
77	In the first sentence of the last paragraph: Corporation for Assigned Network Numbers	Should read: Corporation for Assigned Names and Numbers

Corrections for October 1, 2018

Pg	Error – Seventh Printing	Correction
68	First paragraph — OSPF	GRE

Corrections for December 20, 2017

Pg	Error – Sixth Printing	Correction
362	Chapter 9, Insert Note Between First and Second Paragraphs after Figure 9.6	Note to Insert: **Note UPDATE: The "area [area_number] range 0.0.0.0 0.0.0.0" no longer works in current versions of Cisco IOS as a means to advertise default route information**.

Corrections for November 3, 2017

Pg	Error – Sixth Printing	Correction

87	**Correction to Errata:** Chapter 3, Table 3-4, Second, Third and Fourth Term Examples Reads: **Term** **Example** ISP prefix 2340:1111::/32 Site Prefix or global routing prefix 2340::1111:AAAA::/48 Subnet prefix 2340::1111:AAAA:0001::/64	Should read: **Term** **Example** ISP prefix 2340:1111::/32 Site Prefix or global routing prefix 2340:1111:AAAA::/48 Subnet prefix 2340:1111:AAAA:0001::/64
312	Chapter 8, Type 2 Network LSA Concepts, First Sentence Reads: OSPF uses the concept of a Type 2 LSA to model a multiaccess network—a network with more than two routers connected to the same subnet—while still conforming to the "a link connects only two nodes" rule for the topology.	Should read: OSPF uses the concept of a Type 2 LSA to model a multiaccess network—a network with at least two routers connected to the same subnet—while still conforming to the "a link connects only two nodes" rule for the topology.
798	Appendix A: Answers to the "Do I Know This Already?" Quizzes, Chapter 14, Question 5, Last Sentence in Explanation Reads: Therefore, R1 and R2 would be unable to reach one another.	Should read: A tunnel could not be setup between R1 and R2 (in the absence of an IGP or static routing), because iBGP routers do not (by default) advertise themselves as a next-hop. Therefore, R1 and R2 would be unable to reach one another.

Corrections for July 20, 2017

Pg	Error – Sixth Printing	Correction
537	Chapter 13, Question 12, Answer B Reads: **b.** It lists a prefix/length, plus the PA settings for that prefix.	Should read: **b.** It contains a list of withdrawn routes but no PA settings.
544	Chapter 13, First Paragraph, Last Sentence Reads: Because the combination of the IP address (200.1.1.2 in this case) and port number must be unique, this one IP address can support 216 different concurrent flows.	Should read: Because the combination of the IP address (200.1.1.2 in this case) and port number must be unique, this one IP address can support 2^{16} different concurrent flows.
785	Appendix A, Chapter 5, Answers to the "Do I Know This Already?" Quizzes, Question 13 Answers Reads: **13.** B and C.	Should read: **13**. B, C and D.
798	Appendix A, Chapter 14, Question 5, Explanation, Last sentence Reads: Finally, iBGP packets should not be tunneled between R1 and R2, because they are different autonomous systems.	Should read: A tunnel could not be setup between R1 and R2 (in the absence of an IGP or static routing), because iBGP routers do not (by default) advertise themselves as a next-hop. Therefore, R1 and R2 would be unable to reach one another.

Corrections for June 3, 2017

Pg	Error – Fifth Printing	Correction
96	Chapter 3,Table 3-8, Third Row, Prefix Column Reads: FD00::/8	Should read: FC00::/7
158	Chapter 5, Question 10, a Reads: **a.** 10.10.32.0/19	Should read: **a.** 10.10.32.0/29
178	Chapter 5, Add Note before Offset Lists	Note to add: **NOTE** In the event "K5=0 (as is does by default), the K5/K4+reliability)" equation component is set to a value of 1.
212	Chapter 5, Third Paragraph, First Sentence Reads: For example, Figure 5-19 shows the less efficient routing of packets to host 10.11.1.1, a host off Router B1, assuming that the route summarization shown in Figure 5-14 still exists.	Should read: For example, Figure 5-19 shows the less efficient routing of packets to host 10.11.1.1, a host off Router B1, assuming that the route summarization shown in Figure 5-18 still exists.
212	**Correction to Errata:** Chapter 5, Third Paragraph, Fourth Sentence Reads: Unless all of WAN1's specific routes in the 10.11.0.0/16 range failed, R1 would not notify routers on the right about any problem.	Should read: Unless all of WAN1's specific routes in the 10.11.0.0/16 range failed, it would continue to advertise that summary route.

348	**Correction to Page Number:** Chapter 9, Question 9 Reads: **9.** With an OSPFv3 Address Family configuration supporting both IPv4 and IPv6 routing, which of the following is true regarding OSPFv3's link-state database? **a.** IPv4 LSAs populate one database, while IPv6 LSAs populate a second database. **b.** Information received from all LSAs is aggregated in a single link-state database. **c.** OSPFv3 does not use a link-state database. Rather, it represents link-state information in a lookup table similar to Cisco Express Forwarding (CEF). **d.** A virtual Address Family is created, and it contains information from both IPv4 and IPv6 LSAs.	Should read: **9.** With an OSPFv3 Address Family (AF) configuration supporting both IPv4 and IPv6 routing, which of the following is true? **a.** IPv4 and IPv6 use the same AF. **b.** IPv4 and IPv6 use separate AFs. **c.** OSPFv3 requires the IPv6 AF to have an IPv6 Router ID. **d.** OSPFv3 requires the IPv4 AF to have an IPv6 Router ID.
353	Chapter 9, Example 9-1 caption Reads: **Example 9-1** *R1's and R2's* **distribute-list** *to Filter Manufacturing Routes*	Should read: **Example 9-1** *R1's and R2's* **prefix-list** *to Filter Manufacturing Routes*
534	Chapter 13, Question 3, Second Sentence Reads: R1 and then uses BGP to advertise the route to R2, also in ASN 11.	Should read: R1 then uses BGP to advertise the route to R2, also in ASN 11.

715	Chapter 16, First Paragraph after Note Reads: From a design perspective, strict mode could cause traffic to be dropped if an asynchronous routing situation exists (that is, traffic from a network address space might be received on one router interface, but traffic to that same network address space might be transmitted out of a different router interface). Therefore, strict mode should typically be used where there is no chance of asynchronous routing (for example, a branch office with only one connection going back to a corporate headquarters).	Should read: From a design perspective, strict mode could cause traffic to be dropped if an asymmetric routing situation exists (that is, traffic from a network address space might be received on one router interface, but traffic to that same network address space might be transmitted out of a different router interface). Therefore, strict mode should typically be used where there is no chance of asymmetric routing (for example, a branch office with only one connection going back to a corporate headquarters).
737	Chapter 17, First Paragraph, First Sentence Reads: Protocols such as Enhanced Interior Gateway Routing Protocol (EIGRP) and Open Shortest Path First (OPSF), using multicasts, can dynamically form neighborships with adjacent routers.	Should read: Protocols such as Enhanced Interior Gateway Routing Protocol (EIGRP) and Open Shortest Path First (OSPF), using multicasts, can dynamically form neighborships with adjacent routers.
791	Appendix A, Answer for Question 9 Reads: **9.** B. When using OSPFv3's Address Family configuration to support both IPv4 and IPv6, LSAs for both IPv4 and IPv6 networks populate a single link-state database. The database can be viewed with the **show ospfv3 database** command.	Should read: **9.** B. With OSPFv3, a single OSPF process ID can service multiple Address Families. For example, a single OSPF process ID could support one Address Family performing IPv4 routing, while simultaneously supporting another Address Family performing IPv6 routing.

CD	Appendix F, Page 13, Table 5-9, Seventh Row Down, Answer Column, First Sentence Reads: R1 will list 10.10.0.0/18 as a summary route, AD 5, with outgoing interface null0, if at least one subordinate route exists.	Should read: R1 will list 10.10.0.0/22 as a summary route, AD 5, with outgoing interface null0, if at least one subordinate route exists

Corrections for January 16, 2017

Pg	Error – Fifth Printing	Correction
22	Chapter 1, Third Bullet Point Reads: ▪ **Type of Service field:** The *Type of Service (ToS)* field (commonly referred to as the *ToS Byte* or *DHCP* field) has ….	Should read: ▪ **Type of Service field:** The *Type of Service (ToS)* field (commonly referred to as the *ToS Byte* or *DSCP* field) has ….
76	Chapter 3, First Bullet Point Reads: ▪ **IPsec:** Unlike IPv4, IPv6 requires that every IPv6 implementation support IPsec. IPv6 does not require that each device use IPsec, but any device that implements IPv6 must also have the ability to implement IPsec.	Should read: ▪ **IPsec:** Unlike IPv4, all IPv6 nodes should support IPsec. However, this is a recommendation for IPv6 nodes and not a requirement.
~~87~~	~~Chapter 3, Table 3-4, Second, Third and Fourth Term Examples~~ ~~Reads:~~ ~~**Term** **Example**~~ ~~ISP prefix 2340:1111/32~~ ~~Site Prefix or 2340::1111:AAAA/48~~	~~Should read:~~ ~~**Term** **Example**~~ ~~ISP prefix 2340:1111::/32~~ ~~Site Prefix or global routing prefix 2340::1111:AAAA::/48~~

	~~global routing prefix Subnet prefix 2340::1111:AAAA:0001/64~~	~~Subnet prefix 2340::1111:AAAA:0001::/64~~
97	Chapter 3, Table 3-9, Fourth Purpose Reads: RIPv2 messages	Should read: RIPng messages

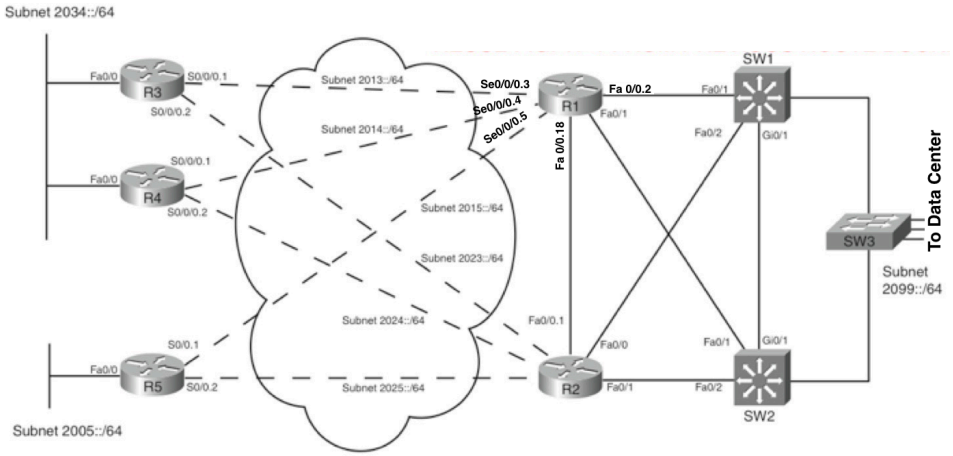
Corrections for October 22, 2016

Pg	Error – Fourth Printing	Correction
391	Chapter 9, Note Reads: **NOTE** Even though the preceding commands used a series of **show ospfv3** commands, you can still use the more traditional **show ipv6 ospf** commands to verify your OSPFv3 Address Family configuration.	Should read: **NOTE** Even though the preceding commands used a series of **show ospfv3** commands, you can still use the more traditional **show ipv6 ospf** commands to verify your OSPFv3 IPv6 Address Family configuration.

Corrections for October 3 2016

Pg	Error – Fourth Printing	Correction
721	Chapter 16, Table 16-4, Standards-based Row, TACACS+ Column Reads: No (Cisco-proprietary)	Should read: Yes (Although TACACS+ was developed by Cisco, it was released as an open standard in 1993.)

Corrections for September 18, 2016

Pg	Error – Fourth Printing	Correction
130	Chapter 4, First Paragraph Reads: To verify the interfaces on which EIGRP is enabled, both the show **ip eigrp interfaces** command (show on R1) and the **show ip protocols** command (shown on R2) list the information. For this example, look at the list of interfaces in R2's **show ip protocols** command output: S0/0/0, S0/0/1, and FA0/0 are listed, but Fa0/1 –unmatched by any of R2's network commands-is not.	Should read: To verify the interfaces on which EIGRP is enabled, you can use the **show ip eigrp interfaces** command. The output from router R1 indicates its Fa0/0, Se0/0/0, Se0/0/1, and Fa0/1 interfaces are participating in the EIGRP routing process.
239	Chapter 6, Figure 6-1, Replace Figure	New Figure: 

Corrections for August 25, 2016

Pg	Error – Fourth Printing	Correction
99	Chapter 3, NOTE Reads: **NOTE** The corresponding Ethernet multicast MAC address would be 0100.5E7B.5004.	Should read: **NOTE** The corresponding Ethernet multicast MAC address would be 3333.FF7B.5004.

Corrections for August 11, 2016

Pg	Error – Fourth Printing	Correction
100	Chapter 3, Table 3-10, Command Column, Fifth Line Down Reads: **ipv6 address** *prefix/length* ***eui64***	Should read: **ipv6 address** *prefix/length* ***eui-64***

Corrections for July 11, 2016

Pg	Error – Third Printing	Correction
33	Chapter 1, Third Bullet Reads: ▪ **Window Field:** The 16-bit *Window* field specifies the number of bytes a sender is willing to transmit before receiving an acknowledgment from the receiver.	Should read: ▪ **Window Field:** The 16-bit *Window* field specifies the number of bytes the sender of the segment is willing to receive before receiving an acknowledgment from the receiver.

Corrections for June 20, 2016

Pg	Error – Third Printing	Correction
19	Chapter 1, Remove **NOTE**	Remove **NOTE** Anycast is an IPv6 concept and is not found in IPv4 networks. Also, note that IPv6 anycast addresses are not unique from IPv6 unicast addresses.

Corrections for June 9, 2016

Pg	Error – Third Printing	Correction
CD	Appendix F, Page 31, Table 10-13, Second Answer Reads: RIP: 120 (all). OSPF: internal 110, external 110. Domain loops are not prevented because RIP's 120 AD is not less than OSPF's external 110.	Should read: RIP: 120 (all). OSPF: internal 110, external 110. Domain loops are prevented due to OSPF's preferring internal routes over E1 routes, and E1 routes over E2 routes.
CD	Appendix F, Page 31, Table 10-13, Last Answer Reads: The configuration redistributes EIGRP learned routes. It will not redistribute: ■ link-local addresses ■ local routes ■ connected routes	Should read: The configuration redistributes EIGRP learned routes and connected routes. It will not redistribute: ■ link-local addresses ■ local routes

CD	Appendix F, Page 32, Table 10-14, Answer to Fifth Row - Filtering routes on redistribution from OSPF into EIGRP Reads: Examples: **router eigrp 1** **redistribute ospf 2 metric 1000 10 255 1** **1500 route-map fred** **route-map fred permit 10** **match ip address 1** or **router eigrp 1** **redistribute ospf 2** **distribute-list 1 out ospf 2**	Should read: Examples: **router eigrp 1** **redistribute ospf 2 metric 1000 10 255 1** **1500 route-map fred** **route-map fred permit 10** **match ip address 1** or **router eigrp 1** **redistribute ospf 2** **default-metric 1000 33 255 1 1500** **distribute-list 1 out ospf 2**

Corrections for May 13, 2016

Pg	Error – Third Printing	Correction
CD	Appendix F, Page 30, Chapter 10, Table 10-12, Design Goal, First Row Reads: The design shows multiple redistribution points with more than two routing domains, and a need to prevent domain loops. (2)	Should read: The design shows multiple redistribution points with more than two routing domains, and a need to prevent domain loops. (3)

CD	Appendix F, Page 30, Chapter 10, Table 10-12, Possible Implementation Choices Covered in this Chapter, First Row, First Column Replace	Replace with: Set high metrics when redistributing. Set administrative distance (AD) on redistributing routers so that internal routes are better than other routing protocol's external routes.
CD	Appendix F, Page 30, Chapter 10, Table 10-12, Design Goal, Second Row, First Column Reads: The design shows multiple redistribution points with more than two routing domains, and a need to prevent domain loops. (2)	Should read: The design shows multiple redistribution points with more than two routing domains, and a need to prevent domain loops. (3)
CD	Appendix F, Page 30, Chapter 10, Table 10-12, Possible Implementation Choices Covered in this Chapter, Second Row, Second Column Replace	Replace with: Set per-route administrative distance (AD) on redistributing routers Filter on subnet while redistributing. Filter on route tag using distribute lists.

Corrections for April 4, 2016

Pg	**Error – Third Printing**	**Correction**
197	Chapter 5, Top Paragraph, Last Sentence Reads: Then, ask yourself: If used by a distribute list on WAN1 to filter the manufacturing	Should read: Then, ask yourself: If used by a distribute list on WAN1 to filter the manufacturing routes (as seen in

	routes (as seen in Figure 15-15), and you want that ACL to filter only manufacturing routes, which of these two-line ACLs meet the requirements?	Figure 5-15), and you want that ACL to filter only manufacturing routes, which of these two-line ACLs meet the requirements?

Corrections for March 24, 2016

Pg	Error – Third Printing	Correction
374	Chapter 9, Step 3 Reads: **Step 3.** R3 floods Type 7 LSAs throughout stub area 34.	Should read: **Step 3.** R3 floods Type 7 LSAs throughout NSSA 34.

Corrections for March 20, 2016

Pg	Error – Third Printing	Correction
137	Chapter 4, Verifying the Hello/Hold Timers, First Sentence Reads: To find the Hello interface and Hold time configured on a router's interface, you could of course look at a router's configuration, but the **show running-config** command might not be available to you on some question types on the ROUTE exam.	Should read: To find the Hello timer for an interface, you could of course look at a router's configuration, but the **show running-config** command might not be available to you on some question types on the ROUTE exam.

169	Chapter 5, Example 5-2, 'show ip eigrp interfaces detail s/0/0/0.9' command Reads: Interface Peers Se1/0 1	Should read: Interface Peers Se0/0/0.9 2
CD	Appendix F, Page 11, Table 4-8, 12th Line Down, Command for 'The configured Hold Timer for an interface.' Reads: Command None	Should read: Command **show running-config**

Corrections for February 3, 2016

Pg	Error – Third Printing	Correction
~~212~~	~~Chapter 5, Third Paragraph, Fourth Sentence~~ ~~Reads:~~ ~~Unless all of WAN1's specific routes in the 10.11.0.0/16 range failed, R1 would not notify routers on the right about any problem.~~	~~Should read:~~ ~~Unless all of WAN1's specific routes in the 10.11.0.0/16 range failed, B1 would not notify routers on the right about any problem.~~

Corrections for January 15, 2016

Pg	Error – Third Printing	Correction
399	Chapter 10, Second and Third Paragraphs are duplicate	Please delete Second Paragraph
595	Chapter 14, Last Paragraph, Third Sentence Reads: Enhanced Interior Gateway Routing Protocol (EIGRP) uses a formula based on a combination of the constraining bandwidth and least delay, and Open Shortest Path First (OSPF) uses lowest cost based on bandwith.	Should read: Enhanced Interior Gateway Routing Protocol (EIGRP) uses a formula based on a combination of the constraining bandwidth and cumulative delay, and Open Shortest Path First (OSPF) uses lowest cost based on bandwith.

Corrections for November 9, 2015

Pg	Error – Second Printing	Correction
283	Chapter 7, Second Paragraph, Third Sentence Reads: Based on Table 7-7, this type should dynamically discovered neighbors, and it does, with neighbor 2.2.2.2 (R2) being listed at the end of the example.	Should read: Based on Table 7-6, this type should dynamically discovered neighbors, and it does, with neighbor 2.2.2.2 (R2) being listed at the end of the example.
425	Chapter 10, Third Paragraph, Second Sentence Reads: Before using these four steps, R4 calculated two possible routes for 172.16.26.0/23: an E2 route directly to	Should read: Before using these four steps, R4 calculated two possible routes for 172.30.26.0/23: an E2 route directly to RD1 and another route through R8.

	RD1 and another route through R8.	
425	Chapter 10, Second Step 3 Reads: **Step 3.** R4's best route to reach RID 1.1.1.1 happens to be through its S0/0/0 interface, to next-hop RD1 (172.16.14.1), so R4's route to 172.16.26.0/23 uses these details.	Should read: **Step 3.** R4's best route to reach RID 1.1.1.1 happens to be through its S0/0/0 interface, to next-hop RD1 (172.16.14.1), so R4's route to 172.30.26.0/23 uses these details.
571	Chapter 13, First Paragraph, Last Sentence Reads: Examples 13-3 and 13-4 show samples of the output of each of these two commands on Router E1, respectively, based on the configuration shown in Example 13-2, with some description following each example.	Should read: Examples 13-3 and 13-4 show samples of the output of each of these two commands on Router E1, respectively, based on the configuration shown in Figure 13-18, with some description following each example.

Corrections for October 21, 2015

Pg	Error – Second Printing	Correction
156	Chapter 5, Question 4, First line output Reads: P 10.11.1.0/24, 2 successors, FD is 2172419	Should read: P 10.11.1.0/24, 2 successors, FD is 2172423
372	Chapter 9, First Paragraph, First Sentence Reads: Example 9-7 shows another example configuration, this time with area 34 as a totally stubby area.	Should read: Example 9-8 shows another example configuration, this time with area 34 as a totally stubby area.

Corrections for September 11, 2015

Pg	Error – Second Printing	Correction
6	Chapter 1, Second Paragraph, First Sentence Reads: A router could know how to reach a network by simply having one of its interfaces directly connect that network.	Should read: A router could know how to reach a network by simply having one of its interfaces directly connected to that network.
31	Chapter 1, Fourth Bullet Point down Reads: ▪ **Rest of Header:** The 4-byte *Rest of Header* field is 4 bytes in length, and its contents are dependent on the specific ICMP type.	Should read: ▪ **Rest of Header:** The 4-byte *Rest of Header* field's contents are dependent on the specific ICMP type.
31	Chapter 1, Sentence Before the Fifth Bullet Point Reads: While ICMP has multiple messages types and codes, for purposes of the ROUTE exam, you should primarily be familiar with the two following ICMP message types:	Should read: While ICMP has multiple message types and codes, for purposes of the ROUTE exam, you should primarily be familiar with the two following ICMP message types:
77	Chapter 3, Global Route Aggregation For Efficient Routing, First Paragraph, Last Sentence Reads: IPv6 public address assignment follows these same well-earned lessons.	Should read: IPv6 public address assignment follows these same well-learned lessons.
121	Chapter 4, Second Paragraph, First Sentence	Should read:

	Reads: In spite of that apparent simplicity, here you sit beginning the first of four chapters of EIGRP coverage in this book.	 In spite of that apparent simplicity, here you sit beginning the first of three chapters of EIGRP coverage in this book.
137	Chapter 4, First Paragraph, Last Sentence Reads: It's important to note, however, that if you use that command on some older versions of Cisco IOS, the Hold time might not displayed.	Should read: It's important to note, however, that if you use that command on some older versions of Cisco IOS, the Hold time might not be displayed.
255	Chapter 6, First Paragraph, First Sentence Reads: To practice skills useful when creating your own OSPF verification plan, list in Table 6-8 all commands that supply the requested information.	Should read: To practice skills useful when creating your own EIGRP verification plan, list in Table 6-8 all commands that supply the requested information.
346	Chapter 9, Question 1, First Sentence Reads: 1. Router B1, an internal router in area 1, displays the following output.	Should read: 1. Router R1, an internal router in area 1, displays the following output.
346	Chapter 9, Question 1, Last Sentence Reads: Which of the following answers is true based on the information in the output from B1?	Should read: Which of the following answers is true based on the information in the output from R1?
383	Chapter 9, First Paragraph, Second Sentence Reads: Also like OSPFv3, Type 2 LSAs show up as	Should read: Also, like OSPFv2, Type 2 LSAs show up as *Net Link*

	Net Link States.	*States*.
439	Chapter 10, Table 10-8, Sixth Prefix Down, 172.16.106.0/29 add Action	Action to add: 172.16.106.0/29 permit
447	Chapter 10, First Paragraph, First Sentence Reads: Note that the **redistribute** command also allows the **match {internal | external 1 | external 2 | nssa-external}** parameters, but these parameters do not set the type or route.	Should read: Note that the **redistribute** command also allows the **match {internal | external 1 | external 2 | nssa-external}** parameters, but these parameters do not set the type of route.
570	Chapter 13, Second Paragraph, First Sentence Reads: Configuring the routers with the **neighbor ebgp-multihop 2** command, as seen in the upcoming Example 13-3, solves the problem.	Should read: Configuring the routers with the **neighbor ebgp-multihop 2** command, as seen in the upcoming Example 13-4, solves the problem.
621	Chapter 14, Table 14-2, Fourth Row, Third Column Reads: AS_Path contents; all NLRI whose AS_Paths are matched considered to be a match	Should read: AS_Path contents; all NLRI whose AS_Paths are matched or considered to be a match
670	Chapter 15, Question 4, Second Sentence After Router R1 Configuration Reads: You notice that IPv4 routes are being successful exchanged, but IPv6 routes are not being exchanged.	Should read: You notice that IPv4 routes are being successfully exchanged, but IPv6 routes are not being exchanged.

673	Chapter 15, First paragraph After Step 2, Third Sentence Reads: Also, for other devices at Router R1's site to reach the Internet, Router R1 should be statically configured with a default routing pointing to the ISP router's IPv6 address of 2000:1::1.	Should read: Also, for other devices at Router R1's site to reach the Internet, Router R1 should be statically configured with a default route pointing to the ISP router's IPv6 address of 2000:1::1.
697	Chapter 15, Table 15-4, Second Row Reads: Configure a default route pointing to an ISP (in global configuration mode).	Should read: Configure an IPv6 default route pointing to an ISP (in global configuration mode).
720	Chapter 16, Second Paragraph, Third Sentence Reads: However, if the TACACS+ is unavailable, the **local** key work instructs the router to perform authentication using the local user database (which includes the user **kevin** with a password of **cisco** in this example).	Should read: However, if the TACACS+ is unavailable, the **local** key word instructs the router to perform authentication using the local user database (which includes the user **kevin** with a password of **cisco** in this example).
757	Chapter 17, Second Paragraph Reads: Unlike configuring OSPFv2 authentication, OSPFv3 authentication can be accomplished with a single command, as illustrated in Example 17-11 for the topology in Figure 7-7.	Should read: Unlike configuring OSPFv2 authentication, OSPFv3 authentication can be accomplished with a single command, as illustrated in Example 17-11 for the topology in Figure 17-7.

760	Chapter 17, Second Paragraph, Second Sentence Reads: Rather, BGP can be enabled on a router with a single command, as demonstrated next.	Should read: Rather, BGP authentication can be enabled on a router with a single command, as demonstrated next.
CD	Appendix D, Page 9, Table 7-5, Sixth Description Down Reads: IP MTU must match.	Should read: IP MTU[1] must match.
CD	Appendix F, Page 7, Table 2-5, Second Command Reads: trace route *ip_address_of_far_side_of_tunnel*	Should read: traceroute *ip_address_of_far_side_of_tunnel*
CD	Appendix F, Page 50, Table 15-4, Second Feature Reads: Configure a default route pointing to an ISP (in global configuration mode.)	Should read: Configure an IPv6 default route pointing to an ISP (in global configuration mode.)
CD	Appendix F, Page 51, Fourth Row, Configuration Commands/Notes Reads: **neighbor** *neighbor's_ipv4_address* remote-as	Should read: **neighbor** *neighbor's_ipv4_address remote-as*

CD	Appendix F, Page 57, Table 17-5, Fifteen Row, Configuration Commands/Notes Reads: **ipv6 ospf authentication ipsec spi** *security_policy_index* **[md5|sh1] {0|7}** *key-string*	Should read: **ipv6 ospf authentication ipsec spi** *security_policy_index* **[md5|sha1] {0|7}** *key-string*

Corrections for September 9, 2015

Pg	Error – Second Printing	Correction
216	Chapter 5, Third Paragraph, Third Sentence Reads: Even so, Cisco IOS will add this default AD value as seen in Example 5-10.	Should read: Even so, Cisco IOS will add this default AD value as seen in Example 5-14.

Corrections for August 27, 2015

Pg	Error – Second Printing	Correction
611	Chapter 14, Understanding Next-Hop Reachability Issues with iBGP, Second Paragraph, First Sentence Reads: Examples 14-5 and 14-6 also happen to show two examples of iBGP-learned routes and their next-hop addresses.	Should read: Examples 14-4 and 14-6 also happen to show two examples of iBGP-learned routes and their next-hop addresses.

611	Chapter 14, Understanding Next-Hop Reachability Issues with iBGP, First Bullet Reads: ▪ **Example 14-5:**	Should read: ▪ **Example 14-4:**
611	Chapter 14, Understanding Next-Hop Reachability Issues with iBGP, First Paragraph after Bullets, First Sentence Reads: In fact, in the case of Example 14-5, the output of the **show ip bgp 181.0.0.0/8** command on E2 listed the phrase "1.1.1.1 from 10.100.1.1 (11.11.11.11)."	Should read: In fact, in the case of Example 14-4, the output of the **show ip bgp 181.0.0.0/8** command on E2 listed the phrase "1.1.1.1 from 10.100.1.1 (11.11.11.11)."

Corrections for August 7, 2015

Pg	Error – Second Printing	Correction
194	Chapter 5, Second Paragraph, Third Sentence Reads: For example, in Figure 5-12, if R1 received Reply messages from R11 and R12, but not R13, and the active timer expired, R1 would bring down the neighborship with R13.	Should read: For example, in Figure 5-13, if R1 received Reply messages from R11 and R12, but not R13, and the active timer expired, R1 would bring down the neighborship with R13.
212	Chapter 5, Step 1 Reads: **Step 1.** Core 1 sends a packet to 10.11.1.1, using its route for	Should read: **Step1.** Core 1 sends a packet to 10.11.1.1, using its route for 10.11.0.0/16, to WAN1.

	10.16.0.0/16, to WAN1.	

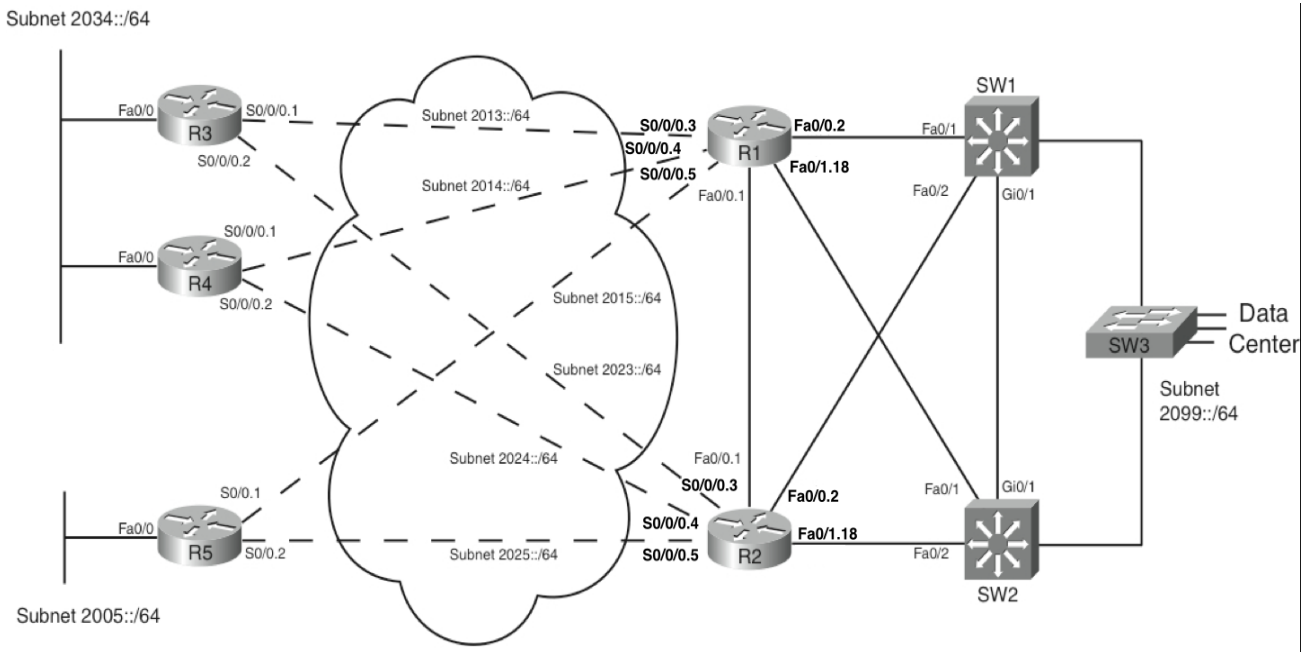
Corrections for June 23, 2015

Pg	Error – Second Printing	Correction
691	Chapter 15, Paragraph after Example 15-14, First Sentence Reads: Example 15-15 shows that Router R1 has learned five IPv6 routes through BGP from Router R2.	Should read: Example 15-14 shows that Router R1 has learned five IPv6 routes through BGP from Router R2.

Corrections for May 26, 2015

Pg	Error – Second Printing	Correction
123 and 739	Chapter 4, Question 6 Remove Question 6 and renumber Question 7 to Question 6	Remove Question 6 and move it to Page 739, Chapter 17, and renumber it to Question 9
783 and 802	Chapter 4, Answer to Question 6 Remove Answer to Question 6 and renumber Question 7 to Question 6	Remove Answer to Question 6 and move it to Page 802, Chapter 17 and renumber it to Answer 9

Corrections for May 15, 2015

Pg	Error – Second Printing	Correction
110	Chapter 3, Replace Figure 3-13	Replace with: 
376	Chapter 9, OSPFv2 and OSPFv3 Comparison, Second Bullet, First Sentence Reads: ▪ **Type 4:** The Type 4 LSA is renamed *Interarea prefix LSA for ASBRs*.	Should read: ▪ **Type 4:** The Type 4 LSA is renamed *Interarea router LSA for ASBRs*.
424	Chapter 10, First Paragraph, Last Sentence Reads: Figure 10-7 shows a sample flooding of the Type 5 LSA for EIGRP subnet 172.30.27.0/23 as an E2 route.	Should read: Figure 10-7 shows a sample flooding of the Type 5 LSA for EIGRP subnet 172.30.26.0/23 as an E2 route.

425	Chapter 10, Last Paragraph, Second Sentence Reads: Again using subnet 172.30.26.0/23 as an example, RD1 first looks at the Type 5 external LSA and sees RID 1.1.1.1 as the advertising ASBR.	Should read: Again using subnet 172.30.26.0/23 as an example, RD4 first looks at the Type 5 external LSA and sees RID 1.1.1.1 as the advertising ASBR.
598	Chapter 14, At the end of Question 5 Reads: (Choose two.)	Should read: (Choose one.)
598	Chapter 14, Question 5, Answer C Reads: C. Redistributing BGP routes into the enterprise IGP.	Should read: C. Setting a higher value for the ebgp-multihop parameter on R1 and R2
798	Appendix A, Chapter 14, Answer to Question 5 Reads: **5.** A and C. The enterprise core routers need to know which exit point (R1 or R2) is best; the correct answers supply those routes to the routers internal to the company. Note that redistribution from BGP into the IGP is not recommended, but it does defeat this particular problem.	Should read: **5.** A. The enterprise core routers need to know which exit point (R1 or R2) is best. Therefore, configuring dual default routes would not resolve the issue. Also, setting the **ebgp-multihop** parameter would have no effect. Finally, iBGP packets should not be tunneled between R1 and R2, because they are different autonomous systems.

Corrections for April 24, 2015

<table>
<tr><th>Pg</th><th>Error – Second Printing</th><th>Correction</th></tr>
<tr><td>329</td><td>Chapter 8, Second Sentence, Third Sentence

Reads:

So R2, when it learns of R1’s Type 1 LSA, sends DD packets to the DR on the R2/R3/R4 LAN.</td><td>Should read:

So R2, when it learns of R1’s Type 1 LSA, sends LSUs to the DR on the R2/R3/R4 LAN.</td></tr>
<tr><td>367</td><td>Chapter 9, First Paragraph, Second Sentence

Reads:

By making area 34 a stub area, ABRs R1 and R2 will not flood Type 3 LSAs into area 34 - other than the Type 3 LSAs for the default routes</td><td>Should read:

By making area 34 a stub area, ABRs R1 and R2 will not flood Type 5 LSAs into area 34, but will instead flood Type 3 LSAs for the default routes.</td></tr>
<tr><td>444</td><td>Chapter 10, Table 10-9

Replace Table 10-9</td><td>Replace with:

Table 10-9 Parameters Used in Metric and Tag Setting Example

<table>
<tr><th>Prefix</th><th>Action</th><th>Metric (Bandwidth, Delay, Reliability, Load, MTU)</th></tr>
<tr><td>172.16.101.0/24</td><td>deny</td><td>–</td></tr>
<tr><td>172.16.102.0/25
172.16.103.0/26</td><td>permit</td><td>1000 44 255 1 1500</td></tr>
<tr><td>172.16.104.0/27
172.16.105.0/28</td><td>deny</td><td>–</td></tr>
<tr><td>172.16.106.0/29
172.16.107.0/30</td><td>permit</td><td>100 4444 255 1 1500</td></tr>
<tr><td>All others</td><td>permit</td><td>1500 10 255 1 1500</td></tr>
</table></td></tr>
</table>

Corrections for April 10, 2015

<table>
<tr><th>Pg</th><th>Error – Second Printing</th><th>Correction</th></tr>
<tr><td>97</td><td>Chapter 3, Second Paragraph, First Sentence

Reads:

All IPv6 multicast addresses begin with FF::/8.</td><td>Should read:

All IPv6 multicast addresses begin with FF00::/8.</td></tr>
<tr><td>97</td><td>Chapter 3, Second Paragraph, Last Sentence

Reads:

A fourth digit of hex 5 identifies the broadcast as having a site local scope, with those multicasts beginning with FF05::/16.</td><td>Should read:

A fourth digit of hex 5 identifies the multicast as having a site local scope, with those multicasts beginning with FF05::/16.</td></tr>
<tr><td>381</td><td>Chapter 9, Second Sentence of Last Paragraph

Reads:

Interestingly, while Routers R1 (1.1.1.1) and R3 (3.3.3.3) are neighbors, Router R2 is not a neighbor.</td><td>Should read:

Interestingly, while Routers R1 (1.1.1.1) and R3 (3.3.3.3) are neighbors, Router R4 is not a neighbor.</td></tr>
<tr><td>439</td><td>Chapter 10, Table 10-8

Replace Table 10-8</td><td>Replace with:

Table 10-8 Parameters Used in Route Filtering Example

<table><tr><th>Prefixes</th><th>Action</th></tr><tr><td>172.16.101.0/24</td><td>deny</td></tr><tr><td>172.16.102.0/25</td><td>permit</td></tr><tr><td>172.16.103.0/26</td><td></td></tr><tr><td>172.16.104.0/27</td><td>deny</td></tr><tr><td>172.16.105.0/28</td><td></td></tr></table></td></tr>
</table>

		172.16.106.0/29 172.16.107.0/30
608	Chapter 14, Example 14-4, Third Line From Bottom Reads: 1 2 111 111	Should read: 1 2 111 112
609	Chapter 14, Example 14-5, Third Line From Bottom Reads: 1 2 111 111, (received & used)	Should read: 1 2 111 112, (received & used)

Corrections for March 27, 2015

Pg	Error – Second Printing	Correction
106	Chapter 3, Example 3-5, Add Command Line between Second and Third Command	Line to add: R2(config)**# ipv6 unicast-routing**
192	Chapter 5, Figure 5-12, WAN1 Updates Reads: 10.11.0.1/16 10.12.0.0/16	Should read: 10.11.0.0/16 10.12.0.0/16
226	Chapter 5, Table 5-9, Row 7 Reads: The plan shows a sample configuration of the **ip summary-address eigrp 1 10.10.0.0 255.255.252.0** command on Router R1. What routes should I see on R1? What will their administrative distance be?	Should read: The plan shows a sample configuration of the **ip summary-address eigrp 1 10.10.0.0 255.255.192.0 5** command on Router R1. What routes should I see on R1? What will their administrative distance be?

CD	Appendix F, Page 13, Table 5-9, Row 7 Reads: The plan shows a sample configuration of the **ip summary-address eigrp 1 10.10.0.0 255.255.252.0** command on Router R1. What routes should I see on R1? What will their administrative distance be?	Should read: The plan shows a sample configuration of the **ip summary-address eigrp 1 10.10.0.0 255.255.192.0 5** command on Router R1. What routes should I see on R1? What will their administrative distance be?
CD	Appendix F, Page 16, First Row of Table, Commands for Display interface bandwidth and delay settings. Reads: show ip eigrp topology show ip eigrp topology *prefix/length*	Remove first command Should read: show ip eigrp topology *prefix/length*

Corrections for March 18, 2015

Pg	**Error – Second Printing**	**Correction**
22	Chapter 1, Third Bullet Point Acronym Reads: DHCP	Should read: DSCP
24	Chapter 1, Second Bullet Point, First Sentence Reads: The *Next Header* field, similar to the Protocol field in an IPv4 header, indicates the type of header encapsulated in the	Should read: The *Next Header* field, similar to the Protocol field in an IPv4 header, indicates the type of header encapsulated in the IPv6 packet.

	IPv6 header.	
91	Chapter 3, Third Paragraph, Fourth Sentence Reads: The conversion also requires flipping the seventh bit inside the IPv6 address, resulting in a 64-bit number that conforms to a convention called the *EUI-64 format*.	Should read: The conversion also requires flipping the seventh bit inside first half of the host's MAC address, resulting in a 64-bit number that conforms to a convention called the *EUI-64 format*.
111	Chapter 3, Second Paragraph, Reads: R1's S0/0/0.3 subinterface, which connects with a permanent virtual circuit (PVC) to Router R3, uses a prefix of 2003:0000:0000:0000::/64, making the entire IPv6 address on this interface, when abbreviated, 2003::1/64—a convenient value for sifting through all the output in the upcoming examples.	Should read: R1's S0/0/0.3 subinterface, which connects with a permanent virtual circuit (PVC) to Router R3, uses a prefix of 2013:0000:0000:0000::/64, making the entire IPv6 address on this interface, when abbreviated, 2013::1/64—a convenient value for sifting through all the output in the upcoming examples.
685	Chapter 15, Step 6 Reads: Activate the BGP neighbor for the IPv6 address family with the **neighbor** *neighbor's_ipv4_address* **activate** command, in IPv6 address family configuration mode.	Should read: Activate the BGP neighbor for the IPv6 address family with the **neighbor** *neighbor's_ipv6_address* **activate** command, in IPv6 address family configuration mode.
801	Appendix A, Chapter 17, Answer and Explanation for Question 2 Reads: 2. C. A key string specifies a preshared key to be used between routers. Therefore, the	Should read: 2. B and C. A key chain can contain multiple keys, each of which has a key number and a key string. While the key chain name is locally significant (and

	key string must match on two routers for them to mutually authenticate. The key chain name and key number values are locally significant and do not have to match on a neighboring router. Also, as long as a matching key on each router is currently active, the specific send and receive lifetimes do not have to match on mutually authenticating routers.	therefore does not have to match between neighboring routers), the key number and key string values do have to match between neighboring routers. Also, as long as a matching key on each router is currently active, the specific send and receive lifetimes do not have to match on mutually authenticating routers.

Corrections for February 25, 2015

Pg	Error – Second Printing	Correction
16	Chapter 1, First Paragraph, Network Technology Fundamentals, Second Sentence Reads: Traffic flow is determined both by the traffic type (for example, unicast, multicast, broadcast, or anycast) and the network architecture type (for example, point-to-point, broadcast, and nonbroadcast multiaccess [NMBA]).	Should read: Traffic flow is determined both by the traffic type (for example, unicast, multicast, broadcast, or anycast) and the network architecture type (for example, point-to-point, broadcast, and nonbroadcast multiaccess [NBMA]).
21	Chapter 1, Second Bullet Point, Second Sentence Reads: Interestingly, OSPF attempts to elect a DR on an NMBA network, by default.	Should read: Interestingly, OSPF attempts to elect a DR on an NBMA network, by default.
187	Chapter 5, Third Paragraph, First Sentence Reads: Next, focus on the route labeled as option	Should read: Next, focus on the route labeled as option 2 in Figure

	2 in Figure 5-9, the route from WAN1, to WAN2, then to B1.	5-10, the route from WAN1, to WAN2, then to B1.
210	Chapter 5, Fourth Paragraph, Second Sentence Reads: For example, for most data center designs, as shown earlier in Figure 5-13, the routes form the left of the figure toward the data center, through Core1 and Core2, would typically be considered equal.	Should read: For example, for most data center designs, as shown earlier in Figure 5-17, the routes form the left of the figure toward the data center, through Core1 and Core2, would typically be considered equal.
386	Chapter 9, Example 9-21, Caption Reads: **Example 9-21** *OSPFv3 Address Family Configuration on Router R3*	Should read: **Example 9-21** *OSPFv3 Address Family Configuration on Router R4*
387	Chapter 9, Example 9-22, Caption Reads: **Example 9-22** *OSPFv3 Address Family Configuration on Router R4*	Should read: **Example 9-22** *OSPFv3 Address Family Configuration on Router R3*
754	Chapter 17, Step 1 Sentence Reads: **Step 1.** Plan text authentication must be enabled for either an interface or an OSPF area:	Should read: **Step 1.** MD5 authentication must be enabled for either an interface or an OSPF area:
CD	Appendix F, Page 33 of the PDF document, Table 10-15, Command(s) Column, Rows 5, 6, 7 and 8 Reads: show ip ospf topology	Should read: show ip ospf database show ip osfp database asbr-summary

	show ip osfp topology asbr-summary show ip ospf topology external show ip ospf topology nssa-external	show ip ospf database external show ip ospf database nssa-external
CD	Appendix F, Page 34 of the PDF document, Table 10-15, Command(s) Column, Row 20 Reads: show ip ospf topology *prefix/length* show ip ospf topology	Should read: show ip ospf database *prefix/length* show ip ospf database

Corrections for February 16, 2015

Pg	**Error – Second Printing**	**Correction**
44	Table 1-4, First Question at top of page 44, (Fifth Question in Table 1-4) Second Sentence Reads: What Layer 4 protocols are typically used to transmit voice and data media? (2)	Should read: What Layer 4 protocols are typically used to transmit voice and video media? (2)
CD	Appendix F, Page 4 of the PDF document, Fifth Question in Table 1-4, Second Sentence Reads: What Layer 4 protocols are typically used to transmit voice and data media? (2)	Should read: What Layer 4 protocols are typically used to transmit voice and video media? (2)

Corrections for February 12, 2015

Pg	Error – Second Printing	Correction
95	Chapter 3, Figure 3-9 Binary in Left box of Figure Reads: 111 110	Should read: 1111 110
96	Chapter 3, Table 3-8 Type of Address, Site local, Prefix Reads: FECO::/10	Should read: FEC0::/10

Corrections for February 4, 2015

Pg	Error – Second Printing	Correction
798	Appendix A, Chapter 14, Question 3, First Sentence of Explanation Reads: The line reading "1.1.1.1 from 2.2.2.2…." implies the BGP RID of the neighbor is 1.1.1.1, with neighbor ID-the IP address on the local router's **neighbor** command-of 2.2.2.2.	Should read: The line reading "1.1.1.1 from 2.2.2.2 (3.3.3.3)" implies that R1 has a next-hop of 1.1.1.1, and it's iBGP neighbor is at an IP address of 2.2.2.2 (which has a router ID of 3.3.3.3).

Corrections for January 28, 2015

Pg	Error – First Printing	Correction
567	Chapter 13, First Paragraph after Steps, Third Sentence Reads: As shown in Figure 13-14, E1 uses update source 10.1.1.1, with I1-1 configuring the **neighbor 10.1.1.1** command.	Should read: As shown in Figure 13-16, E1 uses update source 10.1.1.1, with I1-1 configuring the **neighbor 10.1.1.1** command.

Corrections for January 22, 2015

Pg	Error – First Printing	Correction
21	Chapter 1, Second Bullet Point, Second Sentence Reads: Interestingly, OSPF attempts to elect a DR on an NMBA network, by default.	Should read: Interestingly, OSPF attempts to elect a DR on an NBMA network, by default.
451	Chapter 10, Figure 10-15, Caption Reads: **Figure 10-15** *IDS and IPS Operational Differences*	Should read: **Figure 10-15** *Avoiding Domain Loops from OSPF to EIGRP to OSPF*
544	Chapter 13, First Paragraph, Last Sentence Reads: Because the combination of the IP address (200.1.1.2 in this case) and port number must be unique, this one IP address can support 216 different concurrent flows.	Should read: Because the combination of the IP address (200.1.1.2 in this case) and port number must be unique, this one IP address can support 2^16 different concurrent flows.

This errata sheet is intended to provide updated technical information. Spelling and grammar misprints are updated during the reprint process, but are not listed on this errata sheet.

Updated 12/20/2017