

Report

Cloud Infrastructre Lab 1

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1. Grundlegendes

1.1. Tools

1. Tftpd64 um Konfigurationen zu dumpen
2. jPerf um den Durchsatz zu messen
- 3.
- 4.

2. Informationsbeschaffung

In einem ersten Schritt wurden sämtliche Konfigurationen mit dem Tool Tftpd64 von den Router und Switches kopiert. Diese wurden dann in einem nächsten Schritt auf Fehlkonfigurationen analysiert. Dabei gingen wir nach folgendem Schema vor:

1.

2.1. Konfiguration kopieren

Für jedes Geräte wurden die Outputs der folgenden Befehle auf die lokalen Notebooks kopiert. Alle Konfiguration sind im Anhang A zu finden

```
1 copy run tftp und dann [your local ip addr]
2 show ip interface brief
3 show interface status
4 show cdp neighbors
```

2.2. Analyse des Konfigurationen

2.3. DHCP

DHCP Pool	Beschreibung	Bemerkung
172.16.1.0/24	HR	
172.16.2.0/24	ENGINEERING	
172.16.3.0/24	PRODUCTION	
172.16.4.0/24	FINANCE	
172.16.16.0/24	IT	DHCP exclude 172.16.16.1, 172.16.16.10 172.16.16.12
172.16.17.0/24	SERVER	DHCP exclude 172.16.17.1, 172.16.17.10 172.16.17.12
172.16.18.0/24	MARKETING	DHCP exclude 172.16.18.250, 172.16.18.254, 172.16.18.10 172.16.18.12
172.16.19.0/24	SALES	DHCP exclude 172.16.19.250, 172.16.19.254, 172.16.19.10 172.16.19.12
172.16.103.0/24	Branch 2	DHCP exclude 172.16.103.1, 172.16.103.10, 172.16.103.12

Tabelle 1: DHCP Pools

2.3.1. VLAN

VLAN	Name	Bedeutung
VLAN 10	HR	Personalabteilung
VLAN 11	IT	IT Abteilung
VLAN 99	MGMT	Management
VLAN 100	STAFF	Mitarbeiter
VLAN 150	IWAS	???
VLAN 200	STUDENTS	Studenten

Tabelle 2: VLAN's

VLAN	Subnetz	Bemerkung
VLAN1	172.16.103.0/24	
VLAN10	172.16.1.0/24	
VLAN11	172.16.2.0/24	
VLAN20	no ip addr assigned	(router ospf)
VLAN21	172.16.16.0/24	(mtu-ignore)
VLAN30	172.16.17.0/24	
VLAN40	172.16.18.0/24	(standby)
VLAN41	172.16.19.0/24	(mtu ignore)
VLAN100	172.16.20.0/24	(mtu ignore)
VLAN103	172.16.23.0/24	

Tabelle 3: VLAN Subnetze

3. Logische Topologie

4. Gefundene Fehler

4.1. Layer 1

Auf OSI Layer 1 wurden keine Fehler gefunden.

4.2. Layer 2

4.2.1. Design

- HQ_CS2 bildet die einzige Verbindung zu den Branches. Es bildet somit einen Single Point of Failure

4.2.2. Speed

- Die Port Channel Group 4 beim HQ_CS1 ist auf Half Duplex 100 eingestellt.
- Die Port Channel Group 2 bei HQ_CS2 ist auf 10 eingestellt.

4.2.3. Spanning Tree

4.2.4. VLAN

4.3. Layer 3

4.3.1. Routen

4.4. OSPF

5. Messungen

5.1. Traceroute

Alle Durchgeführten Traceroute Messungen sind im Anhang B zu finden.

5.2. jPerf

6. Empfehlungen

Aufgrund der vorangehenden Erkenntnissen empfehlen wir, an folgenden Punkten anzusetzen:

- 1.

6.1. Kostenvoranschlag

Für die Umsetzung unserer Empfehlungen würden folgende Kosten anfallen.

Beschreibung	Zeitaufwand in h	Stundenansatz in CHF	Total
Total			<u><u>1 Million</u></u>

Tabelle 4: Kostenvoranschlag

A. Konfigurationen

A.1. BR1-R1

A.1.1. Running Configuration

```
1 BR1_R1#show run
2 Building configuration...
3
4
5 Current configuration : 1829 bytes
6 !
7 ! Last configuration change at 16:09:57 UTC Fri Jul 4 2014
8 version 15.1
9 service timestamps debug datetime msec
10 service timestamps log datetime msec
11 no service password-encryption
12 !
13 hostname BR1_R1
14 !
15 boot-start-marker
16 boot-end-marker
17 !
18 !
19 enable secret 5 $1$iIN0$WQSejQFOMmTy6nGBBlqi60
20 !
21 no aaa new-model
22 !
23 memory-size iomem 10
24 !
25 dot11 syslog
26 ip source-route
27 !
28 !
29 ip cef
30 !
31 !
32 !
33 no ipv6 cef
34 !
35 multilink bundle-name authenticated
36 !
37 !
38 !
39 !
40 !
41 !
42 !
43 !
44 !
45 !
46 !
47 voice-card 0
48 !
49 crypto pki token default removal timeout 0
50 !
51 !
52 !
53 !
54 license udi pid CISC02811 sn FCZ14322073
55 archive
```

```
56 log config
57   hidekeys
58 !
59 redundancy
60 !
61 !
62 !
63 !
64 !
65 !
66 !
67 !
68 !
69 !
70 interface Tunnel0
71   ip address 172.16.255.2 255.255.255.252
72   ip ospf 1 area 0
73   tunnel source 200.200.200.2
74   tunnel destination 200.200.200.1
75 !
76 interface FastEthernet0/0
77   ip address 200.200.200.2 255.255.255.240
78   duplex auto
79   speed auto
80 !
81 interface FastEthernet0/1
82   ip address 172.16.100.1 255.255.255.0
83   ip ospf 1 area 0
84   duplex auto
85   speed auto
86 !
87 interface Serial0/0/0
88   ip address 172.16.252.2 255.255.255.0
89   encapsulation frame-relay
90   ip ospf network point-to-multipoint
91   ip ospf 1 area 0
92   no fair-queue
93   frame-relay map ip 172.16.252.1 201 broadcast
94   no frame-relay inverse-arp IP 203
95   frame-relay lmi-type cisco
96 !
97 interface Serial0/0/1
98   no ip address
99   shutdown
100  clock rate 2000000
101 !
102 interface Serial1/0
103   no ip address
104   shutdown
105 !
106 interface Serial1/1
107   no ip address
108   shutdown
109 !
110 interface Serial1/2
111   no ip address
112   shutdown
113 !
114 interface Serial1/3
115   no ip address
116   shutdown
117 !
```

```

118 router ospf 1
119 !
120 ip forward-protocol nd
121 ip http server
122 no ip http secure-server
123 !
124 !
125 !
126 !
127 !
128 !
129 !
130 snmp-server community public RO
131 snmp-server community private RW
132 !
133 !
134 control-plane
135 !
136 !
137 !
138 !
139 mgcp profile default
140 !
141 !
142 !
143 !
144 !
145 !
146 line con 0
147 line aux 0
148 line vty 0 4
149 password ins@lab
150 login
151 transport input all
152 !
153 scheduler allocate 20000 1000
154 end

```

A.1.2. IP Interfaces

```

1 BR1_R1#show ip interface brief
2 Interface IP-Address OK? Method Status Protocol
3 FastEthernet0/0 200.200.200.2 YES manual up up
4 FastEthernet0/1 172.16.100.1 YES manual up up
5 Serial0/0/0 172.16.252.2 YES manual up up
6 Serial0/0/1 unassigned YES unset administratively down down
7 Serial1/0 unassigned YES unset administratively down down
8 Serial1/1 unassigned YES unset administratively down down
9 Serial1/2 unassigned YES unset administratively down down
10 Serial1/3 unassigned YES unset administratively down down
11 Tunnel0 172.16.255.2 YES manual up up

```

A.1.3. Interface Status

```

1 BR1_R1#show int stat
2 FastEthernet0/0
3 Switching path Pkts In Chars In Pkts Out Chars Out
4 Processor 23596 4007024 14953 2485289

```

```

5      Route cache      52      6579      0      0
6      Total    23648  4013603  14953  2485289
7  FastEthernet0/1
8      Switching path Pkts In Chars In Pkts Out Chars Out
9      Processor    17261  4303201  17235  2534976
10     Route cache   4041   276448   3920   580387
11     Total        21302  4579649  21155  3115363
12  Serial0/0/0
13     Switching path Pkts In Chars In Pkts Out Chars Out
14     Processor    13897  899350   15232  1028337
15     Route cache   3920   541187   4041   217118
16     Total        17817  1440537  19273  1245455
17  Interface Serial0/0/1 is disabled
18
19  Interface Serial1/0 is disabled
20
21  Interface Serial1/1 is disabled
22
23  Interface Serial1/2 is disabled
24
25  Interface Serial1/3 is disabled
26
27  Tunnel0
28     Switching path Pkts In Chars In Pkts Out Chars Out
29     Processor     4904  525447   4805   500198
30     Route cache    0      0      0      0
31     Total         4904  525447   4805   500198

```

A.1.4. Neighbors

```

1  BR1_R1#show cdp neighbors
2  Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
3                   S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone,
4                   D - Remote, C - CVTA, M - Two-port Mac Relay
5
6  Device ID    Local Intrfce Holdtme Capability Platform Port ID
7  BR1_S1      Fas 0/1      130      R S I WS-C3560- Fas 0/1
8  Switch      Fas 0/0      120      S I WS-C2960- Fas 0/2
9  BR1_R1#

```

A.2. BR2-R1

A.2.1. Running Configuration

```

1  BR2_R1#show run
2  Building configuration...
3
4
5  Current configuration : 1595 bytes
6  !
7  ! Last configuration change at 23:56:23 UTC Thu Sep 22 2016
8  version 15.1
9  service timestamps debug datetime msec
10 service timestamps log datetime msec
11 no service password-encryption
12 !
13 hostname BR2_R1
14 !

```

```
15 boot-start-marker
16 boot-end-marker
17 !
18 !
19 enable secret 5 $1$tooV$GpQ3VCxj1U3jlmnAZbnQr/
20 !
21 no aaa new-model
22 !
23 memory-size iomem 10
24 !
25 dot11 syslog
26 ip source-route
27 !
28 !
29 ip cef
30 !
31 !
32 !
33 no ipv6 cef
34 !
35 multilink bundle-name authenticated
36 !
37 !
38 !
39 !
40 !
41 !
42 !
43 !
44 !
45 !
46 !
47 voice-card 0
48 !
49 crypto pki token default removal timeout 0
50 !
51 !
52 !
53 !
54 license udi pid CISC02811 sn FCZ1432207G
55 archive
56   log config
57   hidekeys
58 !
59 redundancy
60 !
61 !
62 !
63 !
64 !
65 !
66 !
67 !
68 !
69 !
70 interface Tunnel0
71   ip address 172.16.255.6 255.255.255.252
72   ip ospf 1 area 0
73   tunnel source 200.200.200.3
74   tunnel destination 200.200.200.1
75 !
76 interface FastEthernet0/0
```



```
77 ip address 200.200.200.3 255.255.255.240
78 duplex auto
79 speed auto
80 !
81 interface FastEthernet0/1
82 ip address 172.16.102.1 255.255.255.0
83 ip ospf 1 area 0
84 duplex auto
85 speed auto
86 !
87 interface Serial0/0/0
88 ip address 172.16.252.3 255.255.255.0
89 encapsulation frame-relay
90 ip ospf network point-to-multipoint
91 ip ospf 1 area 0
92 frame-relay map ip 172.16.252.1 301 broadcast
93 frame-relay lmi-type cisco
94 !
95 interface Serial0/0/1
96 no ip address
97 shutdown
98 clock rate 2000000
99 !
100 router ospf 1
101 !
102 ip forward-protocol nd
103 no ip http server
104 no ip http secure-server
105 !
106 !
107 !
108 !
109 !
110 !
111 !
112 snmp-server community public R0
113 snmp-server community private RW
114 !
115 !
116 control-plane
117 !
118 !
119 !
120 !
121 mgcp profile default
122 !
123 !
124 !
125 !
126 !
127 !
128 line con 0
129 line aux 0
130 line vty 0 4
131 password ins@lab
132 login
133 transport input all
134 !
135 scheduler allocate 20000 1000
136 end
```

A.2.2. IP Interfaces

```

1 BR2_R1#show ip interface brief
2 Interface                IP-Address  OK? Method Status      Protocol
3 FastEthernet0/0          200.200.200.3 YES manual up          up
4 FastEthernet0/1          172.16.102.1 YES manual up          up
5 Serial0/0/0              172.16.252.3 YES manual up          up
6 Serial0/0/1              unassigned YES unset administratively down down
7 Tunnel0                  172.16.255.6 YES manual up          up

```

A.2.3. Interface Status

```

1 war leer

```

A.2.4. Neighbors

```

1 Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
2                   S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone,
3                   D - Remote, C - CVTA, M - Two-port Mac Relay
4
5 Device ID    Local Intrfce Holdtme Capability Platform Port ID
6 BR2_S1      Fas 0/1      134          R S I WS-C3560V Fas 0/1
7 Switch      Fas 0/0      137          S I WS-C2960- Fas 0/3

```

A.3. BR2-S1

A.3.1. Running Configuration

```

1 BR2_S1#show running-config
2 Building configuration...
3
4 Current configuration : 2667 bytes
5 !
6 ! Last configuration change at 13:10:42 UTC Mon Mar 1 1993
7 !
8 version 15.0
9 no service pad
10 service timestamps debug datetime msec
11 service timestamps log datetime msec
12 no service password-encryption
13 !
14 hostname BR2_S1
15 !
16 boot-start-marker
17 boot-end-marker
18 !
19 enable secret 5 $1$51.0$ebtjgur4cQu.x/Jy1FUIA1
20 !
21 username ins password 0 ins@lab
22 no aaa new-model
23 system mtu routing 1500
24 vtp domain CCIE
25 vtp mode transparent
26 ip routing
27 no ip domain-lookup

```

```
28 ip dhcp excluded-address 172.16.103.1
29 ip dhcp excluded-address 172.16.103.10 172.16.103.12
30 !
31 ip dhcp pool BRANCH2
32 network 172.16.103.0 255.255.255.0
33 default-router 172.16.103.1
34 !
35 !
36 !
37 !
38 crypto pki trustpoint HTTPS_SS_CERT_KEYPAIR
39 enrollment selfsigned
40 serial-number
41 revocation-check none
42 rsa-keypair HTTPS_SS_CERT_KEYPAIR
43 !
44 !
45 crypto pki certificate chain HTTPS_SS_CERT_KEYPAIR
46 certificate self-signed 01
47 quit
48 !
49 !
50 !
51 !
52 !
53 spanning-tree mode pvst
54 spanning-tree extend system-id
55 !
56 vlan internal allocation policy ascending
57 !
58 vlan 2-5
59 !
60 vlan 10
61 name HR
62 !
63 vlan 11
64 name IT
65 !
66 vlan 17,19,46,1006
67 !
68 !
69 !
70 !
71 !
72 !
73 !
74 !
75 !
76 !
77 !
78 !
79 !
80 !
81 interface FastEthernet0/1
82 no switchport
83 ip address 172.16.102.2 255.255.255.0
84 ip ospf 1 area 0
85 !
86 interface FastEthernet0/2
87 switchport trunk encapsulation dot1q
88 switchport mode trunk
89 !
```

```
90 interface FastEthernet0/3
91   switchport trunk encapsulation dot1q
92   switchport mode trunk
93   !
94 interface FastEthernet0/4
95   switchport trunk encapsulation dot1q
96   switchport mode trunk
97   !
98 interface FastEthernet0/5
99   switchport trunk encapsulation dot1q
100  switchport mode trunk
101  !
102 interface FastEthernet0/6
103   switchport trunk encapsulation dot1q
104   switchport mode trunk
105   !
106 interface FastEthernet0/7
107   switchport trunk encapsulation dot1q
108   switchport mode trunk
109   !
110 interface FastEthernet0/8
111   !
112 interface FastEthernet0/9
113   !
114 interface FastEthernet0/10
115   !
116 interface FastEthernet0/11
117   !
118 interface FastEthernet0/12
119   !
120 interface FastEthernet0/13
121   !
122 interface FastEthernet0/14
123   !
124 interface FastEthernet0/15
125   !
126 interface FastEthernet0/16
127   !
128 interface FastEthernet0/17
129   !
130 interface FastEthernet0/18
131   !
132 interface FastEthernet0/19
133   !
134 interface FastEthernet0/20
135   !
136 interface FastEthernet0/21
137   !
138 interface FastEthernet0/22
139   !
140 interface FastEthernet0/23
141   !
142 interface FastEthernet0/24
143   !
144 interface GigabitEthernet0/1
145   !
146 interface GigabitEthernet0/2
147   !
148 interface Vlan1
149   ip address 172.16.103.1 255.255.255.0
150   ip ospf 1 area 0
151   shutdown
```

```

152 !
153 interface Vlan103
154   ip address 172.16.23.1 255.255.255.0
155   ip ospf 1 area 0
156 !
157 router ospf 1
158 !
159 ip http server
160 ip http secure-server
161 !
162 !
163 ip sla enable reaction-alerts
164 snmp-server community private RW
165 snmp-server community public R0
166 !
167 !
168 line con 0
169 line vty 0 4
170   password cisco
171   login
172 line vty 5 15
173   password cisco
174   login
175 !
176 end

```

A.3.2. IP Interfaces

```

1 BR2-S1#show ip interface brief
2 Interface      IP-Address  OK? Method Status      Protocol
3 Vlan1          172.16.103.1 YES manual administratively down down
4 Vlan103        172.16.23.1 YES manual down        down
5 FastEthernet0/1 172.16.102.2 YES manual up          up
6 FastEthernet0/2 unassigned   YES unset up          up
7 FastEthernet0/3 unassigned   YES unset up          up
8 FastEthernet0/4 unassigned   YES unset up          up
9 FastEthernet0/5 unassigned   YES unset up          up
10 FastEthernet0/6 unassigned   YES unset up          up
11 FastEthernet0/7 unassigned   YES unset up          up
12 FastEthernet0/8 unassigned   YES unset down        down
13 FastEthernet0/9 unassigned   YES unset down        down
14 FastEthernet0/10 unassigned   YES unset down        down
15 FastEthernet0/11 unassigned   YES unset down        down
16 FastEthernet0/12 unassigned   YES unset down        down
17 FastEthernet0/13 unassigned   YES unset down        down
18 FastEthernet0/14 unassigned   YES unset down        down
19 FastEthernet0/15 unassigned   YES unset down        down
20 FastEthernet0/16 unassigned   YES unset down        down
21 FastEthernet0/17 unassigned   YES unset down        down
22 FastEthernet0/18 unassigned   YES unset down        down
23 FastEthernet0/19 unassigned   YES unset down        down
24 FastEthernet0/20 unassigned   YES unset down        down
25 FastEthernet0/21 unassigned   YES unset down        down
26 FastEthernet0/22 unassigned   YES unset down        down
27 FastEthernet0/23 unassigned   YES unset down        down
28 FastEthernet0/24 unassigned   YES unset down        down
29 GigabitEthernet0/1 unassigned YES unset down        down
30 GigabitEthernet0/2 unassigned YES unset down        down

```

A.3.3. Interface Status

```

1 BR2_S1#show int stat
2 Interface Vlan1 is disabled
3
4 Vlan103
5     Switching path Pkts In Chars In Pkts Out Chars Out
6         Processor    0      0      0      0
7         Route cache   0      0      0      0
8         Total         0      0      0      0
9
10 FastEthernet0/1
11     Switching path Pkts In Chars In Pkts Out Chars Out
12         Processor  6087  578068  10408  1136458
13         Route cache    0      0      0      0
14         Total      6087  578068  10408  1136458
15
16 FastEthernet0/2
17     Switching path Pkts In Chars In Pkts Out Chars Out
18         Processor    0      0  214509 14998495
19         Route cache   0      0      0      0
20         Total         0      0  214509 14998495
21
22 FastEthernet0/3
23     Switching path Pkts In Chars In Pkts Out Chars Out
24         Processor    0      0  10423  1112441
25         Route cache   0      0      0      0
26         Total         0      0  10423  1112441
27
28 FastEthernet0/4
29     Switching path Pkts In Chars In Pkts Out Chars Out
30         Processor    0      0 288995 19894189
31         Route cache   0      0      0      0
32         Total         0      0 288995 19894189
33
34 FastEthernet0/5
35     Switching path Pkts In Chars In Pkts Out Chars Out
36         Processor    0      0 267067 18446985
37         Route cache   0      0      0      0
38         Total         0      0 267067 18446985
39
40 FastEthernet0/6
41     Switching path Pkts In Chars In Pkts Out Chars Out
42         Processor    0      0 266983 18437453
43         Route cache   0      0      0      0
44         Total         0      0 266983 18437453
45
46 FastEthernet0/7
47     Switching path Pkts In Chars In Pkts Out Chars Out
48         Processor    0      0 266999 18438475
49         Route cache   0      0      0      0
50         Total         0      0 266999 18438475
51
52 FastEthernet0/8
53     Switching path Pkts In Chars In Pkts Out Chars Out
54         Processor    0      0   1938  146004
55         Route cache   0      0      0      0
56         Total         0      0   1938  146004
57
58 FastEthernet0/9
59     Switching path Pkts In Chars In Pkts Out Chars Out
60         Processor    0      0      0      0
61         Route cache   0      0      0      0
62         Total         0      0      0      0
63
64 FastEthernet0/10
65     Switching path Pkts In Chars In Pkts Out Chars Out
66         Processor    0      0      0      0
67         Route cache   0      0      0      0
68         Total         0      0      0      0
69
70 FastEthernet0/11

```

```

60      Switching path Pkts In Chars In Pkts Out Chars Out
61      Processor      0      0      0      0
62      Route cache    0      0      0      0
63      Total          0      0      0      0
64 FastEthernet0/12
65      Switching path Pkts In Chars In Pkts Out Chars Out
66      Processor      0      0      0      0
67      Route cache    0      0      0      0
68      Total          0      0      0      0
69 FastEthernet0/13
70      Switching path Pkts In Chars In Pkts Out Chars Out
71      Processor      0      0      0      0
72      Route cache    0      0      0      0
73      Total          0      0      0      0
74 FastEthernet0/14
75      Switching path Pkts In Chars In Pkts Out Chars Out
76      Processor      0      0      0      0
77      Route cache    0      0      0      0
78      Total          0      0      0      0
79 FastEthernet0/15
80      Switching path Pkts In Chars In Pkts Out Chars Out
81      Processor      0      0      0      0
82      Route cache    0      0      0      0
83      Total          0      0      0      0
84 FastEthernet0/16
85      Switching path Pkts In Chars In Pkts Out Chars Out
86      Processor      0      0      0      0
87      Route cache    0      0      0      0
88      Total          0      0      0      0
89 FastEthernet0/17
90      Switching path Pkts In Chars In Pkts Out Chars Out
91      Processor      0      0      0      0
92      Route cache    0      0      0      0
93      Total          0      0      0      0
94 FastEthernet0/18
95      Switching path Pkts In Chars In Pkts Out Chars Out
96      Processor      0      0      0      0
97      Route cache    0      0      0      0
98      Total          0      0      0      0
99 FastEthernet0/19
100     Switching path Pkts In Chars In Pkts Out Chars Out
101     Processor      0      0      0      0
102     Route cache    0      0      0      0
103     Total          0      0      0      0
104 FastEthernet0/20
105     Switching path Pkts In Chars In Pkts Out Chars Out
106     Processor      0      0      0      0
107     Route cache    0      0      0      0
108     Total          0      0      0      0
109 FastEthernet0/21
110     Switching path Pkts In Chars In Pkts Out Chars Out
111     Processor      0      0      0      0
112     Route cache    0      0      0      0
113     Total          0      0      0      0
114 FastEthernet0/22
115     Switching path Pkts In Chars In Pkts Out Chars Out
116     Processor      0      0      0      0
117     Route cache    0      0      0      0
118     Total          0      0      0      0
119 FastEthernet0/23
120     Switching path Pkts In Chars In Pkts Out Chars Out
121     Processor      0      0      0      0

```

```

122         Route cache      0      0      0      0
123         Total            0      0      0      0
124 FastEthernet0/24
125     Switching path Pkts In Chars In Pkts Out Chars Out
126     Processor       0      0      0      0
127     Route cache      0      0      0      0
128     Total            0      0      0      0
129 GigabitEthernet0/1
130     Switching path Pkts In Chars In Pkts Out Chars Out
131     Processor       0      0      0      0
132     Route cache      0      0      0      0
133     Total            0      0      0      0
134 GigabitEthernet0/2
135     Switching path Pkts In Chars In Pkts Out Chars Out
136     Processor       0      0      0      0
137     Route cache      0      0      0      0
138     Total            0      0      0      0

```

A.3.4. Neighbors

```

1 BR2_S1# show cdp neighbors
2 Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
3 S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone,
4 D - Remote, C - CVTA, M - Two-port Mac Relay
5
6 Device ID    Local Intfcae Holdtme Capability Platform Port ID
7 BR2_S4      Fas 0/7      150          S I WS-C2960- Fas 0/24
8 BR2_S4      Fas 0/6      150          S I WS-C2960- Fas 0/23
9 BR2_S2      Fas 0/3      143          S I WS-C3560V Fas 0/24
10 BR2_S2      Fas 0/2      143          S I WS-C3560V Fas 0/23
11 BR2_S3      Fas 0/5      175          S I WS-C2960- Fas 0/24
12 BR2_S3      Fas 0/4      175          S I WS-C2960- Fas 0/23
13 BR2_R1      Fas 0/1      131          R S I 2811   Fas 0/1
14 BR2_S1#

```

A.4. CCNA-CCNP-FRSwitch

A.4.1. Running Configuration

```

1 CCNA-CCNP-FRSwitch#show run
2 Building configuration...
3
4 Current configuration : 2648 bytes
5 !
6 version 12.3
7 service timestamps debug datetime msec
8 service timestamps log datetime msec
9 no service password-encryption
10 !
11 hostname CCNA-CCNP-FRSwitch
12 !
13 boot-start-marker
14 boot-end-marker
15 !
16 !
17 memory-size iomem 10
18 no aaa new-model
19 ip subnet-zero

```



```
20 | !
21 | !
22 | !
23 | ip cef
24 | frame-relay switching
25 | !
26 | !
27 | !
28 | !
29 | !
30 | !
31 | !
32 | !
33 | !
34 | !
35 | !
36 | !
37 | !
38 | !
39 | !
40 | interface Ethernet0/0
41 |   no ip address
42 |   shutdown
43 |   half-duplex
44 |   no cdp enable
45 |   no clns route-cache
46 | !
47 | interface Ethernet0/1
48 |   no ip address
49 |   shutdown
50 |   half-duplex
51 |   no cdp enable
52 |   no clns route-cache
53 | !
54 | interface Serial1/0
55 |   description 102 103 104
56 |   no ip address
57 |   encapsulation frame-relay
58 |   clockrate 64000
59 |   no fair-queue
60 |   no clns route-cache
61 |   frame-relay intf-type dce
62 |   frame-relay route 102 interface Serial1/1 201
63 |   frame-relay route 103 interface Serial1/2 301
64 |   frame-relay route 104 interface Serial1/3 401
65 | !
66 | interface Serial1/1
67 |   description 201 203
68 |   no ip address
69 |   encapsulation frame-relay
70 |   clockrate 64000
71 |   no clns route-cache
72 |   frame-relay intf-type dce
73 |   frame-relay route 201 interface Serial1/0 102
74 |   frame-relay route 203 interface Serial1/2 302
75 | !
76 | interface Serial1/2
77 |   description 301 302
78 |   no ip address
79 |   encapsulation frame-relay
80 |   clockrate 64000
81 |   no clns route-cache
```

```
82 frame-relay intf-type dce
83 frame-relay route 301 interface Serial1/0 103
84 frame-relay route 302 interface Serial1/1 203
85 !
86 interface Serial1/3
87 description 301 302
88 no ip address
89 encapsulation frame-relay
90 clockrate 64000
91 no clns route-cache
92 frame-relay intf-type dce
93 frame-relay route 301 interface Serial1/0 103
94 frame-relay route 302 interface Serial1/1 203
95 !
96 interface Serial1/4
97 description 102 103 104
98 no ip address
99 encapsulation frame-relay
100 clockrate 64000
101 no fair-queue
102 no clns route-cache
103 frame-relay intf-type dce
104 frame-relay route 102 interface Serial1/5 201
105 frame-relay route 103 interface Serial1/6 301
106 frame-relay route 104 interface Serial1/7 401
107 !
108 interface Serial1/5
109 description 201 203
110 no ip address
111 encapsulation frame-relay
112 clockrate 64000
113 no clns route-cache
114 frame-relay intf-type dce
115 frame-relay route 201 interface Serial1/4 102
116 frame-relay route 203 interface Serial1/6 302
117 !
118 interface Serial1/6
119 description 301 302
120 no ip address
121 encapsulation frame-relay
122 clockrate 64000
123 no clns route-cache
124 frame-relay intf-type dce
125 frame-relay route 301 interface Serial1/4 103
126 frame-relay route 302 interface Serial1/5 203
127 !
128 interface Serial1/7
129 description 401
130 no ip address
131 encapsulation frame-relay
132 clockrate 64000
133 no clns route-cache
134 frame-relay intf-type dce
135 frame-relay route 401 interface Serial1/4 104
136 !
137 no ip http server
138 ip classless
139 !
140 !
141 no cdp run
142 !
143 !
```

```

144 !
145 !
146 !
147 !
148 line con 0
149 line aux 0
150 line vty 0 4
151 login
152 !
153 !
154 end

```

A.4.2. IP Interfaces

```

1 CCNA-CCNP-FRSwitch#show ip interface brief
2 Interface      IP-Address  OK? Method Status      Protocol
3 Ethernet0/0    unassigned YES NVRAM administratively down down
4 Ethernet0/1    unassigned YES NVRAM administratively down down
5 Serial1/0      unassigned YES NVRAM up          up
6 Serial1/1      unassigned YES NVRAM up          up
7 Serial1/2      unassigned YES NVRAM down        down
8 Serial1/3      unassigned YES manual up          up
9 Serial1/4      unassigned YES NVRAM down        down
10 Serial1/5      unassigned YES NVRAM down        down
11 Serial1/6      unassigned YES NVRAM down        down
12 Serial1/7      unassigned YES NVRAM down        down

```

A.4.3. Interface Status

```

1 CCNA-CCNP-FRSwitch#show int sta
2 Interface Ethernet0/0 is disabled
3
4 Interface Ethernet0/1 is disabled
5
6 Serial1/0
7   Switching path Pkts In Chars In Pkts Out Chars Out
8     Processor    6055   80073   6024   102162
9     Route cache  11641  1618848  10962  1342326
10    Total        17696  1698921  16986  1444488
11 Serial1/1
12   Switching path Pkts In Chars In Pkts Out Chars Out
13     Processor    6049   80432   6017   94029
14     Route cache  9743   940370   9632  1196100
15    Total        15792  1020802  15649  1290129
16 Serial1/2
17   Switching path Pkts In Chars In Pkts Out Chars Out
18     Processor      0        0        0        0
19     Route cache      0        0        0        0
20    Total           0        0        0        0
21 Serial1/3
22   Switching path Pkts In Chars In Pkts Out Chars Out
23     Processor    1950   60176   1281   20109
24     Route cache      0        0        0        0

```

A.4.4. Neighbors

```
1 CCNA-CCNP-FRSwitch#show cdp neighbors
2 % CDP is not enabled
3 CCNA-CCNP-FRSwitch#
```

A.5. HQ FrameRelay Router (HQ-FRR)

A.5.1. Running Configuration

```
1 HQ_FRR#show run
2
3 Building configuration...
4
5
6 Current configuration : 1810 bytes
7 !
8 ! Last configuration change at 22:56:57 UTC Thu Sep 22 2016
9 version 15.1
10 service timestamps debug datetime msec
11 service timestamps log datetime msec
12 no service password-encryption
13 !
14 hostname HQ_FRR
15 !
16 boot-start-marker
17 boot-end-marker
18 !
19 !
20 enable secret 5 $1$FscR$wXNeNkzJuiZqfM2mESMKM/
21 !
22 no aaa new-model
23 !
24 memory-size iomem 10
25 !
26 dot11 syslog
27 ip source-route
28 !
29 !
30 ip cef
31 !
32 !
33 !
34 no ipv6 cef
35 !
36 multilink bundle-name authenticated
37 !
38 !
39 !
40 !
41 !
42 !
43 !
44 !
45 !
46 !
47 !
48 voice-card 0
49 !
50 crypto pki token default removal timeout 0
51 !
```

```
52 | !
53 | !
54 | !
55 | license udi pid CISC02811 sn FCZ1432207U
56 | archive
57 |   log config
58 |     hidekeys
59 | !
60 | redundancy
61 | !
62 | !
63 | !
64 | !
65 | !
66 | !
67 | !
68 | !
69 | !
70 | !
71 | interface FastEthernet0/0
72 |   ip address 172.16.254.62 255.255.255.252
73 |   ip ospf 1 area 0
74 |   duplex auto
75 |   speed auto
76 | !
77 | interface FastEthernet0/1
78 |   no ip address
79 |   shutdown
80 |   duplex auto
81 |   speed auto
82 | !
83 | interface Serial0/0/0
84 |   no ip address
85 |   encapsulation frame-relay
86 |   no fair-queue
87 |   frame-relay lmi-type cisco
88 | !
89 | interface Serial0/0/0.123 multipoint
90 |   ip address 172.16.252.1 255.255.255.0
91 |   ip ospf network point-to-multipoint
92 |   ip ospf 1 area 0
93 |   snmp trap link-status
94 |   frame-relay map ip 172.16.252.3 103 broadcast
95 |   frame-relay map ip 172.16.252.4 104 broadcast
96 |   frame-relay map ip 172.16.252.2 102 broadcast
97 | !
98 | interface Serial0/0/1
99 |   no ip address
100 |   shutdown
101 |   clock rate 2000000
102 | !
103 | interface Serial1/0
104 |   no ip address
105 |   shutdown
106 | !
107 | interface Serial1/1
108 |   no ip address
109 |   shutdown
110 | !
111 | interface Serial1/2
112 |   no ip address
113 |   shutdown
```

```

114 !
115 interface Serial1/3
116   no ip address
117   shutdown
118 !
119 router ospf 1
120 !
121 ip forward-protocol nd
122 ip http server
123 no ip http secure-server
124 !
125 !
126 !
127 !
128 !
129 !
130 !
131 snmp-server community public R0
132 snmp-server community private RW
133 !
134 !
135 control-plane
136 !
137 !
138 !
139 !
140 mgcp profile default
141 !
142 !
143 !
144 !
145 !
146 !
147 line con 0
148 line aux 0
149 line vty 0 4
150   password ins@lab
151   login
152   transport input all
153 !
154 scheduler allocate 20000 1000
155 end      R S I 2811   Fas 0/1
156 HQ_FRR#

```

A.5.2. IP Interfaces

```

1 HQ_FRR#show ip interface brief
2 Interface      IP-Address  OK? Method Status      Protocol
3 FastEthernet0/0 172.16.254.62 YES manual up          up
4 FastEthernet0/1 unassigned YES unset administratively down down
5 Serial0/0/0     unassigned YES unset up          up
6 Serial0/0/0.123 172.16.252.1 YES manual up          up
7 Serial0/0/1     unassigned YES unset administratively down down
8 Serial1/0       unassigned YES unset administratively down down
9 Serial1/1       unassigned YES unset administratively down down
10 Serial1/2       unassigned YES unset administratively down down
11 Serial1/3       unassigned YES unset administratively down down

```

A.5.3. Interface Status

```

1 HQ_FRR#show int stat
2 FastEthernet0/0
3     Switching path Pkts In Chars In Pkts Out Chars Out
4         Processor  11417 2039747 15264 2269864
5         Route cache 7789 864229 8372 558345
6         Total      19206 2903976 23636 2828209
7 Interface FastEthernet0/1 is disabled
8
9 Serial0/0/0
10    Switching path Pkts In Chars In Pkts Out Chars Out
11        Processor 10981 1113980 11642 1052162
12        Route cache 8372 474625 7789 755301
13        Total     19353 1588605 19431 1807463
14 Interface Serial0/0/1 is disabled
15
16 Interface Serial1/0 is disabled
17
18 Interface Serial1/1 is disabled
19
20 Interface Serial1/2 is disabled
21
22 Interface Serial1/3 is disabled

```

A.5.4. Neighbors

```

1 HQ_FRR#show cdp neighbors
2 Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
3                   S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone,
4                   D - Remote, C - CVTA, M - Two-port Mac Relay
5
6 Device ID      Local Intrfce Holdtme Capability Platform Port ID
7 HQ_WER1        Fas 0/0      145

```

A.6. HQ-IER1

A.6.1. Running Configuration

```

1 BR1_R1#show run
2 Building configuration...
3
4
5 Current configuration : 1829 bytes
6 !
7 ! Last configuration change at 16:09:57 UTC Fri Jul 4 2014
8 version 15.1
9 service timestamps debug datetime msec
10 service timestamps log datetime msec
11 no service password-encryption
12 !
13 hostname BR1_R1
14 !
15 boot-start-marker
16 boot-end-marker
17 !
18 !

```

```
19 enable secret 5 $1$iIN0$WQSejQFOMmTy6nGBblqi60
20 !
21 no aaa new-model
22 !
23 memory-size iomem 10
24 !
25 dot11 syslog
26 ip source-route
27 !
28 !
29 ip cef
30 !
31 !
32 !
33 no ipv6 cef
34 !
35 multilink bundle-name authenticated
36 !
37 !
38 !
39 !
40 !
41 !
42 !
43 !
44 !
45 !
46 !
47 voice-card 0
48 !
49 crypto pki token default removal timeout 0
50 !
51 !
52 !
53 !
54 license udi pid CISC02811 sn FCZ14322073
55 archive
56   log config
57   hidekeys
58 !
59 redundancy
60 !
61 !
62 !
63 !
64 !
65 !
66 !
67 !
68 !
69 !
70 interface Tunnel0
71   ip address 172.16.255.2 255.255.255.252
72   ip ospf 1 area 0
73   tunnel source 200.200.200.2
74   tunnel destination 200.200.200.1
75 !
76 interface FastEthernet0/0
77   ip address 200.200.200.2 255.255.255.240
78   duplex auto
79   speed auto
80 !
```



```
81 interface FastEthernet0/1
82 ip address 172.16.100.1 255.255.255.0
83 ip ospf 1 area 0
84 duplex auto
85 speed auto
86 !
87 interface Serial0/0/0
88 ip address 172.16.252.2 255.255.255.0
89 encapsulation frame-relay
90 ip ospf network point-to-multipoint
91 ip ospf 1 area 0
92 no fair-queue
93 frame-relay map ip 172.16.252.1 201 broadcast
94 no frame-relay inverse-arp IP 203
95 frame-relay lmi-type cisco
96 !
97 interface Serial0/0/1
98 no ip address
99 shutdown
100 clock rate 2000000
101 !
102 interface Serial1/0
103 no ip address
104 shutdown
105 !
106 interface Serial1/1
107 no ip address
108 shutdown
109 !
110 interface Serial1/2
111 no ip address
112 shutdown
113 !
114 interface Serial1/3
115 no ip address
116 shutdown
117 !
118 router ospf 1
119 !
120 ip forward-protocol nd
121 ip http server
122 no ip http secure-server
123 !
124 !
125 !
126 !
127 !
128 !
129 !
130 snmp-server community public R0
131 snmp-server community private RW
132 !
133 !
134 control-plane
135 !
136 !
137 !
138 !
139 mgcp profile default
140 !
141 !
142 !
```

```

143 !
144 !
145 !
146 line con 0
147 line aux 0
148 line vty 0 4
149 password ins@lab
150 login
151 transport input all
152 !
153 scheduler allocate 20000 1000
154 end

```

A.6.2. IP Interfaces

```

1 BR1_R1# show ip int brief
2 Interface IP-Address OK? Method Status Protocol
3 FastEthernet0/0 200.200.200.2 YES manual up up
4 FastEthernet0/1 172.16.100.1 YES manual up up
5 Serial0/0/0 172.16.252.2 YES manual up up
6 Serial0/0/1 unassigned YES unset administratively down down
7 Serial1/0 unassigned YES unset administratively down down
8 Serial1/1 unassigned YES unset administratively down down
9 Serial1/2 unassigned YES unset administratively down down
10 Serial1/3 unassigned YES unset administratively down down
11 Tunnel0 172.16.255.2 YES manual up up
12 BR1_R1#

```

A.6.3. Interface Status

```

1 BR1_R1#show int stat
2 FastEthernet0/0
3     Switching path Pkts In Chars In Pkts Out Chars Out
4     Processor 22380 3923705 14760 2464011
5     Route cache 52 6579 0 0
6     Total 22432 3930284 14760 2464011
7 FastEthernet0/1
8     Switching path Pkts In Chars In Pkts Out Chars Out
9     Processor 16927 4264320 16764 2498748
10    Route cache 4041 276448 3920 580387
11    Total 20968 4540768 20684 3079135
12 Serial0/0/0
13    Switching path Pkts In Chars In Pkts Out Chars Out
14    Processor 13211 843517 13447 908579
15    Route cache 3920 541187 4041 217118
16    Total 17131 1384704 17488 1125697
17 Interface Serial0/0/1 is disabled
18
19 Interface Serial1/0 is disabled
20
21 Interface Serial1/1 is disabled
22
23 Interface Serial1/2 is disabled
24
25 Interface Serial1/3 is disabled
26
27 Tunnel0
28    Switching path Pkts In Chars In Pkts Out Chars Out

```

29	Processor	4812	515851	4715	490834
30	Route cache	0	0	0	0
31	Total	4812	515851	4715	490834

A.6.4. Neighbors

```

1 BR1_R1#show cdp neighbors
2 Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
3                   S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone,
4                   D - Remote, C - CVTA, M - Two-port Mac Relay
5
6 Device ID      Local Intrfce Holdtme Capability Platform Port ID
7 BR1_S1        Fas 0/1      143          R S I WS-C3560- Fas 0/1
8 Switch        Fas 0/0      133          S I WS-C2960- Fas 0/2
9 BR1_R1#

```

A.7. HQ-WER1

A.7.1. Running Configuration

```

1 HQ_WER1#show running-config
2 Building configuration...
3
4
5 Current configuration : 1524 bytes
6 !
7 ! Last configuration change at 23:58:14 UTC Thu Sep 22 2016
8 version 15.1
9 service timestamps debug datetime msec
10 service timestamps log datetime msec
11 no service password-encryption
12 !
13 hostname HQ_WER1
14 !
15 boot-start-marker
16 boot-end-marker
17 !
18 !
19 enable secret 5 $1$RJx0$6QppMo5PI1VrlwnDvu//l1
20 !
21 no aaa new-model
22 !
23 memory-size iomem 10
24 !
25 dot11 syslog
26 ip source-route
27 !
28 !
29 ip cef
30 !
31 !
32 !
33 no ipv6 cef
34 !
35 multilink bundle-name authenticated
36 !
37 !
38 !

```

```
39 | !
40 | !
41 | !
42 | !
43 | !
44 | !
45 | !
46 | !
47 | voice-card 0
48 | !
49 | crypto pki token default removal timeout 0
50 | !
51 | !
52 | !
53 | !
54 | license udi pid CISC02811 sn FCZ104770XM
55 | archive
56 |   log config
57 |   hidekeys
58 | !
59 | redundancy
60 | !
61 | !
62 | !
63 | !
64 | !
65 | !
66 | !
67 | !
68 | !
69 | !
70 | interface FastEthernet0/0
71 |   ip address 172.16.254.58 255.255.255.252
72 |   ip ospf 1 area 0
73 |   duplex auto
74 |   speed auto
75 | !
76 | interface FastEthernet0/1
77 |   ip address 172.16.254.61 255.255.255.252
78 |   ip ospf 1 area 0
79 |   duplex auto
80 |   speed auto
81 | !
82 | interface Serial0/0/0
83 |   no ip address
84 |   shutdown
85 |   no fair-queue
86 |   clock rate 2000000
87 | !
88 | interface Serial0/0/1
89 |   no ip address
90 |   shutdown
91 |   clock rate 2000000
92 | !
93 | interface Serial1/0
94 |   no ip address
95 |   shutdown
96 | !
97 | interface Serial1/1
98 |   no ip address
99 |   shutdown
100 | !
```

```

101 interface Serial1/2
102   no ip address
103   shutdown
104   !
105 interface Serial1/3
106   no ip address
107   shutdown
108   !
109 router ospf 1
110   !
111   ip forward-protocol nd
112   ip http server
113   no ip http secure-server
114   !
115   !
116   !
117   !
118   !
119   !
120   !
121   snmp-server community public R0
122   snmp-server community private RW
123   !
124   !
125   control-plane
126   !
127   !
128   !
129   !
130   mgcp profile default
131   !
132   !
133   !
134   !
135   !
136   !
137   line con 0
138   line aux 0
139   line vty 0 4
140     password ins@lab
141     login
142     transport input all
143   !
144   scheduler allocate 20000 1000
145 end

```

A.7.2. IP Interfaces

```

1 HQ_WER1#show ip interface brief
2 Interface      IP-Address  OK? Method Status      Protocol
3 FastEthernet0/0 172.16.254.58 YES manual up          up
4 FastEthernet0/1 172.16.254.61 YES manual up          up
5 Serial0/0/0     unassigned YES unset  administratively down down
6 Serial0/0/1     unassigned YES unset  administratively down down
7 Serial1/0       unassigned YES unset  administratively down down
8 Serial1/1       unassigned YES unset  administratively down down
9 Serial1/2       unassigned YES unset  administratively down down
10 Serial1/3       unassigned YES unset  administratively down down

```

A.7.3. Interface Status

```

1 HQ_WER1#show int status
2 HQ_WER1#
3 HQ_WER1#show int stat
4 FastEthernet0/0
5     Switching path Pkts In Chars In Pkts Out Chars Out
6         Processor 25850 6849093 15600 2284014
7         Route cache 7084 813091 7104 483627
8         Total 32934 7662184 22704 2767641
9 FastEthernet0/1
10     Switching path Pkts In Chars In Pkts Out Chars Out
11         Processor 11567 2042240 16272 2336919
12         Route cache 7104 514628 7084 784531
13         Total 18671 2556868 23356 3121450
14 Interface Serial0/0/0 is disabled
15
16 Interface Serial0/0/1 is disabled
17
18 Interface Serial1/0 is disabled
19
20 Interface Serial1/1 is disabled
21
22 Interface Serial1/2 is disabled
23
24 Interface Serial1/3 is disabled
25

```

A.7.4. Neighbors

```

1 HQ_WER1#show cdp neighbors
2 Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
3                   S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone,
4                   D - Remote, C - CVTA, M - Two-port Mac Relay
5
6 Device ID    Local Intrfce Holdtme Capability Platform Port ID
7 HQ_FRR      Fas 0/1      125      R S I 2811  Fas 0/0
8 HQ_CS2      Fas 0/0      155      R S I WS-C3560V Fas 0/21

```

A.8. HQ CS1

A.8.1. Running Configuration

```

1
2 !
3 ! Last configuration change at 07:31:17 UTC Mon Mar 1 1993
4 !
5 version 15.0
6 no service pad
7 service timestamps debug datetime msec
8 service timestamps log datetime msec
9 no service password-encryption
10 service sequence-numbers
11 !
12 hostname HQ_CS1
13 !
14 boot-start-marker

```

```
15 boot-end-marker
16 !
17 enable secret 5 $1$sMhJ$dd5KAmhultwZd0/DAD/Lm/
18 !
19 username ins password 0 ins@lab
20 no aaa new-model
21 system mtu routing 1500
22 ip routing
23 no ip domain-lookup
24 !
25 !
26 !
27 !
28 crypto pki trustpoint HTTPS_SS_CERT_KEYPAIR
29 enrollment selfsigned
30 serial-number
31 revocation-check none
32 rsa-keypair HTTPS_SS_CERT_KEYPAIR
33 !
34 !
35 crypto pki certificate chain HTTPS_SS_CERT_KEYPAIR
36 certificate self-signed 01
37     quit
38 !
39 !
40 !
41 !
42 !
43 spanning-tree mode pvst
44 spanning-tree extend system-id
45 !
46 vlan internal allocation policy ascending
47 !
48 !
49 !
50 !
51 !
52 !
53 !
54 !
55 !
56 !
57 !
58 !
59 !
60 !
61 interface Loopback100
62 ip address 172.16.25.1 255.255.255.0
63 ip ospf 1 area 0
64 !
65 interface Port-channel1
66 no switchport
67 ip address 172.16.254.1 255.255.255.252
68 ip ospf 1 area 0
69 !
70 interface Port-channel2
71 no switchport
72 ip address 172.16.254.5 255.255.255.252
73 ip ospf 1 area 0
74 !
75 interface Port-channel3
76 no switchport
```

```
77 | bandwidth 10000
78 | ip address 172.16.254.33 255.255.255.248
79 | ip ospf mtu-ignore
80 | ip ospf 1 area 0
81 | speed 10
82 | !
83 | interface Port-channel4
84 | no switchport
85 | bandwidth 100000
86 | ip address 172.16.254.41 255.255.255.248
87 | ip ospf mtu-ignore
88 | ip ospf 1 area 0
89 | speed 100
90 | duplex half
91 | !
92 | interface FastEthernet0/1
93 | no switchport
94 | no ip address
95 | channel-group 1 mode on
96 | !
97 | interface FastEthernet0/2
98 | no switchport
99 | no ip address
100 | channel-group 1 mode on
101 | !
102 | interface FastEthernet0/3
103 | no switchport
104 | no ip address
105 | channel-group 1 mode on
106 | !
107 | interface FastEthernet0/4
108 | no switchport
109 | no ip address
110 | channel-group 1 mode on
111 | !
112 | interface FastEthernet0/5
113 | no switchport
114 | no ip address
115 | channel-group 2 mode on
116 | !
117 | interface FastEthernet0/6
118 | no switchport
119 | no ip address
120 | channel-group 2 mode on
121 | !
122 | interface FastEthernet0/7
123 | no switchport
124 | no ip address
125 | channel-group 2 mode on
126 | !
127 | interface FastEthernet0/8
128 | no switchport
129 | no ip address
130 | channel-group 2 mode on
131 | !
132 | interface FastEthernet0/9
133 | !
134 | interface FastEthernet0/10
135 | !
136 | interface FastEthernet0/11
137 | !
138 | interface FastEthernet0/12
```



```
139 | !
140 | interface FastEthernet0/13
141 |   no switchport
142 |   no ip address
143 |   speed 10
144 |   channel-group 3 mode on
145 | !
146 | interface FastEthernet0/14
147 |   no switchport
148 |   no ip address
149 |   speed 10
150 |   channel-group 3 mode on
151 | !
152 | interface FastEthernet0/15
153 |   no switchport
154 |   no ip address
155 |   speed 10
156 |   channel-group 3 mode on
157 | !
158 | interface FastEthernet0/16
159 |   no switchport
160 |   no ip address
161 |   speed 10
162 |   channel-group 3 mode on
163 | !
164 | interface FastEthernet0/17
165 |   no switchport
166 |   no ip address
167 |   speed 100
168 |   duplex half
169 |   channel-group 4 mode on
170 | !
171 | interface FastEthernet0/18
172 |   no switchport
173 |   no ip address
174 |   speed 100
175 |   duplex half
176 |   channel-group 4 mode on
177 | !
178 | interface FastEthernet0/19
179 |   no switchport
180 |   no ip address
181 |   speed 100
182 |   duplex half
183 |   channel-group 4 mode on
184 | !
185 | interface FastEthernet0/20
186 |   no switchport
187 |   no ip address
188 |   speed 100
189 |   duplex half
190 |   channel-group 4 mode on
191 | !
192 | interface FastEthernet0/21
193 | !
194 | interface FastEthernet0/22
195 | !
196 | interface FastEthernet0/23
197 | !
198 | interface FastEthernet0/24
199 | !
200 | interface GigabitEthernet0/1
```

```

201 !
202 interface GigabitEthernet0/2
203 !
204 interface Vlan1
205 no ip address
206 !
207 router ospf 1
208 !
209 ip http server
210 ip http secure-server
211 !
212 !
213 ip sla enable reaction-alerts
214 snmp-server community public R0
215 snmp-server community private RW
216 !
217 !
218 line con 0
219 logging synchronous
220 line vty 0 4
221 password cisco
222 login
223 line vty 5 15
224 password cisco
225 login
226 !
227 end

```

A.8.2. IP Interfaces

	Interface	IP-Address	OK?	Method	Status	Protocol
1	Vlan1	unassigned	YES	unset	up	down
2	FastEthernet0/1	unassigned	YES	manual	up	up
3	FastEthernet0/2	unassigned	YES	manual	up	up
4	FastEthernet0/3	unassigned	YES	manual	up	up
5	FastEthernet0/4	unassigned	YES	manual	up	up
6	FastEthernet0/5	unassigned	YES	manual	up	up
7	FastEthernet0/6	unassigned	YES	manual	up	up
8	FastEthernet0/7	unassigned	YES	manual	up	up
9	FastEthernet0/8	unassigned	YES	manual	up	up
10	FastEthernet0/9	unassigned	YES	unset	down	down
11	FastEthernet0/10	unassigned	YES	unset	down	down
12	FastEthernet0/11	unassigned	YES	unset	down	down
13	FastEthernet0/12	unassigned	YES	unset	down	down
14	FastEthernet0/13	unassigned	YES	manual	up	up
15	FastEthernet0/14	unassigned	YES	manual	up	up
16	FastEthernet0/15	unassigned	YES	manual	up	up
17	FastEthernet0/16	unassigned	YES	manual	up	up
18	FastEthernet0/17	unassigned	YES	manual	up	up
19	FastEthernet0/18	unassigned	YES	manual	up	up
20	FastEthernet0/19	unassigned	YES	manual	up	up
21	FastEthernet0/20	unassigned	YES	manual	up	up
22	FastEthernet0/21	unassigned	YES	unset	down	down
23	FastEthernet0/22	unassigned	YES	unset	down	down
24	FastEthernet0/23	unassigned	YES	unset	down	down
25	FastEthernet0/24	unassigned	YES	unset	down	down
26	GigabitEthernet0/1	unassigned	YES	unset	down	down
27	GigabitEthernet0/2	unassigned	YES	unset	down	down
28	Port-channel1	172.16.254.1	YES	manual	up	up
29	Port-channel2	172.16.254.5	YES	manual	up	up
30						

31	Port-channel3	172.16.254.33	YES	manual	up	up
32	Port-channel4	172.16.254.41	YES	manual	up	up
33	Loopback100	172.16.25.1	YES	manual	up	up

A.8.3. Interface Status

1	Port	Name	Status	Vlan	Duplex	Speed	Type
2	Fa0/1		connected	routed	a-full	a-100	10/100BaseTX
3	Fa0/2		connected	routed	a-full	a-100	10/100BaseTX
4	Fa0/3		connected	routed	a-full	a-100	10/100BaseTX
5	Fa0/4		connected	routed	a-full	a-100	10/100BaseTX
6	Fa0/5		connected	routed	a-full	a-100	10/100BaseTX
7	Fa0/6		connected	routed	a-full	a-100	10/100BaseTX
8	Fa0/7		connected	routed	a-full	a-100	10/100BaseTX
9	Fa0/8		connected	routed	a-full	a-100	10/100BaseTX
10	Fa0/9		notconnect	1	auto	auto	10/100BaseTX
11	Fa0/10		notconnect	1	auto	auto	10/100BaseTX
12	Fa0/11		notconnect	1	auto	auto	10/100BaseTX
13	Fa0/12		notconnect	1	auto	auto	10/100BaseTX
14	Fa0/13		connected	routed	a-full	10	10/100BaseTX
15	Fa0/14		connected	routed	a-full	10	10/100BaseTX
16	Fa0/15		connected	routed	a-full	10	10/100BaseTX
17	Fa0/16		connected	routed	a-full	10	10/100BaseTX
18	Fa0/17		connected	routed	half	100	10/100BaseTX
19	Fa0/18		connected	routed	half	100	10/100BaseTX
20	Fa0/19		connected	routed	half	100	10/100BaseTX
21	Fa0/20		connected	routed	half	100	10/100BaseTX
22	Fa0/21		notconnect	1	auto	auto	10/100BaseTX
23							
24	Port	Name	Status	Vlan	Duplex	Speed	Type
25	Fa0/22		notconnect	1	auto	auto	10/100BaseTX
26	Fa0/23		notconnect	1	auto	auto	10/100BaseTX
27	Fa0/24		notconnect	1	auto	auto	10/100BaseTX
28	Gi0/1		notconnect	1	auto	auto	Not Present
29	Gi0/2		notconnect	1	auto	auto	Not Present
30	Po1		connected	routed	a-full	a-100	
31	Po2		connected	routed	a-full	a-100	
32	Po3		connected	routed	a-full	10	
33	Po4		connected	routed	half	100	

A.8.4. Neighbors

1	Device	ID	Local	Intfrfce	Holdtme	Capability	Platform	Port	ID
2	HQ_DS1		Fas	0/16	175	R S I WS-C3560V	Fas	0/4	
3	HQ_DS1		Fas	0/15	175	R S I WS-C3560V	Fas	0/3	
4	HQ_DS1		Fas	0/14	175	R S I WS-C3560V	Fas	0/2	
5	HQ_DS1		Fas	0/13	160	R S I WS-C3560V	Fas	0/1	
6	HQ_DS2		Fas	0/20	160	R S I WS-C3560V	Fas	0/8	
7	HQ_DS2		Fas	0/19	160	R S I WS-C3560V	Fas	0/7	
8	HQ_DS2		Fas	0/18	160	R S I WS-C3560V	Fas	0/6	
9	HQ_DS2		Fas	0/17	160	R S I WS-C3560V	Fas	0/5	
10	HQ_CS2		Fas	0/4	170	R S I WS-C3560V	Fas	0/4	
11	HQ_CS2		Fas	0/3	159	R S I WS-C3560V	Fas	0/3	
12	HQ_CS2		Fas	0/2	159	R S I WS-C3560V	Fas	0/2	
13	HQ_CS2		Fas	0/1	159	R S I WS-C3560V	Fas	0/1	
14	HQ_CS3		Fas	0/8	178	R S I WS-C3560-	Fas	0/8	
15	HQ_CS3		Fas	0/6	178	R S I WS-C3560-	Fas	0/6	
16	HQ_CS3		Fas	0/7	178	R S I WS-C3560-	Fas	0/7	

17	HQ_CS3	Fas 0/5	178	R S I WS-C3560- Fas 0/5
----	--------	---------	-----	-------------------------

A.9. HQ CS2

A.9.1. Running Configuration

```
1
2  !
3  ! Last configuration change at 08:38:55 UTC Mon Mar 1 1993
4  !
5  version 15.0
6  no service pad
7  service timestamps debug datetime msec
8  service timestamps log datetime msec
9  no service password-encryption
10 service sequence-numbers
11 !
12 hostname HQ_CS2
13 !
14 boot-start-marker
15 boot-end-marker
16 !
17 enable secret 5 $1$2GLo$vsF1.pg28M8/YjQJtzH.r/
18 !
19 username ins password 0 ins@lab
20 no aaa new-model
21 system mtu routing 1500
22 ip routing
23 no ip domain-lookup
24 !
25 !
26 !
27 !
28 crypto pki trustpoint HTTPS_SS_CERT_KEYPAIR
29   enrollment selfsigned
30   serial-number
31   revocation-check none
32   rsakeypair HTTPS_SS_CERT_KEYPAIR
33 !
34 !
35 crypto pki certificate chain HTTPS_SS_CERT_KEYPAIR
36   certificate self-signed 01
37     quit
38 !
39 !
40 !
41 !
42 !
43 spanning-tree mode pvst
44 spanning-tree extend system-id
45 !
46 vlan internal allocation policy ascending
47 !
48 !
49 !
50 !
51 !
52 !
53 !
54 !
```

```
55 | !
56 | !
57 | !
58 | !
59 | !
60 | !
61 | interface Loopback100
62 |   ip address 172.16.25.2 255.255.255.0
63 |   ip ospf 1 area 0
64 | !
65 | interface Port-channel1
66 |   no switchport
67 |   ip address 172.16.254.2 255.255.255.252
68 |   ip ospf mtu-ignore
69 |   ip ospf 1 area 0
70 | !
71 | interface Port-channel2
72 |   no switchport
73 |   bandwidth 10000
74 |   ip address 172.16.254.13 255.255.255.252
75 |   ip ospf mtu-ignore
76 |   ip ospf 1 area 0
77 |   speed 10
78 | !
79 | interface Port-channel3
80 |   no switchport
81 |   ip address 172.16.254.50 255.255.255.248
82 |   ip ospf mtu-ignore
83 |   ip ospf 1 area 0
84 | !
85 | interface FastEthernet0/1
86 |   no switchport
87 |   no ip address
88 |   channel-group 1 mode on
89 | !
90 | interface FastEthernet0/2
91 |   no switchport
92 |   no ip address
93 |   channel-group 1 mode on
94 | !
95 | interface FastEthernet0/3
96 |   no switchport
97 |   no ip address
98 |   channel-group 1 mode on
99 | !
100 | interface FastEthernet0/4
101 |   no switchport
102 |   no ip address
103 |   channel-group 1 mode on
104 | !
105 | interface FastEthernet0/5
106 |   no switchport
107 |   no ip address
108 |   speed 10
109 |   channel-group 2 mode on
110 | !
111 | interface FastEthernet0/6
112 |   no switchport
113 |   no ip address
114 |   speed 10
115 |   channel-group 2 mode on
116 | !
```

```
117 interface FastEthernet0/7
118 no switchport
119 no ip address
120 speed 10
121 channel-group 2 mode on
122 !
123 interface FastEthernet0/8
124 no switchport
125 no ip address
126 speed 10
127 channel-group 2 mode on
128 !
129 interface FastEthernet0/9
130 !
131 interface FastEthernet0/10
132 !
133 interface FastEthernet0/11
134 !
135 interface FastEthernet0/12
136 !
137 interface FastEthernet0/13
138 no switchport
139 no ip address
140 ip ospf mtu-ignore
141 ip ospf 1 area 0
142 channel-group 3 mode on
143 !
144 interface FastEthernet0/14
145 no switchport
146 no ip address
147 ip ospf mtu-ignore
148 ip ospf 1 area 0
149 channel-group 3 mode on
150 !
151 interface FastEthernet0/15
152 no switchport
153 no ip address
154 ip ospf mtu-ignore
155 ip ospf 1 area 0
156 channel-group 3 mode on
157 !
158 interface FastEthernet0/16
159 no switchport
160 no ip address
161 ip ospf mtu-ignore
162 ip ospf 1 area 0
163 channel-group 3 mode on
164 !
165 interface FastEthernet0/17
166 !
167 interface FastEthernet0/18
168 !
169 interface FastEthernet0/19
170 !
171 interface FastEthernet0/20
172 !
173 interface FastEthernet0/21
174 no switchport
175 ip address 172.16.254.57 255.255.255.252
176 ip ospf 1 area 0
177 !
178 interface FastEthernet0/22
```

```

179 no switchport
180 ip address 172.16.254.65 255.255.255.252
181 ip ospf 1 area 0
182 !
183 interface FastEthernet0/23
184 !
185 interface FastEthernet0/24
186 !
187 interface GigabitEthernet0/1
188 !
189 interface GigabitEthernet0/2
190 !
191 interface Vlan1
192 no ip address
193 shutdown
194 !
195 router ospf 1
196 !
197 ip http server
198 ip http secure-server
199 !
200 !
201 ip sla enable reaction-alerts
202 snmp-server community public R0
203 snmp-server community private RW
204 !
205 !
206 line con 0
207 logging synchronous
208 line vty 0 4
209 password cisco
210 login
211 line vty 5 15
212 password cisco
213 login
214 !
215 end

```

A.9.2. IP Interfaces

	Interface	IP-Address	OK?	Method	Status	Protocol
1	Vlan1	unassigned	YES	unset	administratively down	down
2	FastEthernet0/1	unassigned	YES	manual	up	up
3	FastEthernet0/2	unassigned	YES	manual	up	up
4	FastEthernet0/3	unassigned	YES	manual	up	up
5	FastEthernet0/4	unassigned	YES	manual	up	up
6	FastEthernet0/5	unassigned	YES	manual	up	up
7	FastEthernet0/6	unassigned	YES	manual	up	up
8	FastEthernet0/7	unassigned	YES	manual	up	up
9	FastEthernet0/8	unassigned	YES	manual	up	up
10	FastEthernet0/9	unassigned	YES	unset	down	down
11	FastEthernet0/10	unassigned	YES	unset	down	down
12	FastEthernet0/11	unassigned	YES	unset	down	down
13	FastEthernet0/12	unassigned	YES	unset	down	down
14	FastEthernet0/13	unassigned	YES	manual	up	up
15	FastEthernet0/14	unassigned	YES	manual	up	up
16	FastEthernet0/15	unassigned	YES	manual	up	up
17	FastEthernet0/16	unassigned	YES	manual	up	up
18	FastEthernet0/17	unassigned	YES	unset	down	down
19	FastEthernet0/18	unassigned	YES	unset	down	down
20						

```

21 FastEthernet0/19 unassigned YES unset down down
22 FastEthernet0/20 unassigned YES unset down down
23 FastEthernet0/21 172.16.254.57 YES manual up up
24 FastEthernet0/22 172.16.254.65 YES manual up up
25 FastEthernet0/23 unassigned YES unset down down
26 FastEthernet0/24 unassigned YES unset down down
27 GigabitEthernet0/1 unassigned YES unset down down
28 GigabitEthernet0/2 unassigned YES unset down down
29 Port-channel1 172.16.254.2 YES manual up up
30 Port-channel2 172.16.254.13 YES manual up up
31 Port-channel3 172.16.254.50 YES manual up up
32 Loopback100 172.16.25.2 YES manual up up

```

A.9.3. Interface Status

```

1
2 Port      Name      Status  Vlan  Duplex Speed Type
3 Fa0/1     connected routed  a-full a-100 10/100BaseTX
4 Fa0/2     connected routed  a-full a-100 10/100BaseTX
5 Fa0/3     connected routed  a-full a-100 10/100BaseTX
6 Fa0/4     connected routed  a-full a-100 10/100BaseTX
7 Fa0/5     connected routed  a-full 10 10/100BaseTX
8 Fa0/6     connected routed  a-full 10 10/100BaseTX
9 Fa0/7     connected routed  a-full 10 10/100BaseTX
10 Fa0/8     connected routed  a-full 10 10/100BaseTX
11 Fa0/9     notconnect 1      auto auto 10/100BaseTX
12 Fa0/10    notconnect 1      auto auto 10/100BaseTX
13 Fa0/11    notconnect 1      auto auto 10/100BaseTX
14 Fa0/12    notconnect 1      auto auto 10/100BaseTX
15 Fa0/13    connected routed  a-full a-100 10/100BaseTX
16 Fa0/14    connected routed  a-full a-100 10/100BaseTX
17 Fa0/15    connected routed  a-full a-100 10/100BaseTX
18 Fa0/16    connected routed  a-full a-100 10/100BaseTX
19 Fa0/17    notconnect 1      auto auto 10/100BaseTX
20 Fa0/18    notconnect 1      auto auto 10/100BaseTX
21 Fa0/19    notconnect 1      auto auto 10/100BaseTX
22 Fa0/20    notconnect 1      auto auto 10/100BaseTX
23 Fa0/21    connected routed  a-full a-100 10/100BaseTX
24
25 Port      Name      Status  Vlan  Duplex Speed Type
26 Fa0/22    connected routed  a-full a-100 10/100BaseTX
27 Fa0/23    notconnect 1      auto auto 10/100BaseTX
28 Fa0/24    notconnect 1      auto auto 10/100BaseTX
29 Gi0/1     notconnect 1      auto auto Not Present
30 Gi0/2     notconnect 1      auto auto Not Present
31 Po1       connected routed  a-full a-100
32 Po2       connected routed  a-full 10
33 Po3       connected routed  a-full a-100

```

A.9.4. Neighbors

```

1 Device ID   Local Intrfce Holdtme Capability Platform Port ID
2 HQ_IER1     Fas 0/22     130      R S I 2811  Fas 0/0
3 HQ_WER1     Fas 0/21     157      R S I 2811  Fas 0/0
4 HQ_CS4      Fas 0/8      148      R S I WS-C3560- Fas 0/8
5 HQ_CS4      Fas 0/7      148      R S I WS-C3560- Fas 0/7
6 HQ_CS4      Fas 0/6      148      R S I WS-C3560- Fas 0/6
7 HQ_CS4      Fas 0/5      148      R S I WS-C3560- Fas 0/5

```


8	HQ_DS2	Fas 0/16	159	R S I WS-C3560V Fas 0/4
9	HQ_DS2	Fas 0/15	159	R S I WS-C3560V Fas 0/3
10	HQ_DS2	Fas 0/14	159	R S I WS-C3560V Fas 0/2
11	HQ_DS2	Fas 0/13	159	R S I WS-C3560V Fas 0/1
12	HQ_CS1	Fas 0/3	167	R S I WS-C3560V Fas 0/3
13	HQ_CS1	Fas 0/4	167	R S I WS-C3560V Fas 0/4
14	HQ_CS1	Fas 0/1	167	R S I WS-C3560V Fas 0/1
15	HQ_CS1	Fas 0/2	167	R S I WS-C3560V Fas 0/2

A.10. HQ CS3

A.10.1. Running Configuration

```

1  !
2  !
3  version 12.2
4  no service pad
5  service timestamps debug datetime msec
6  service timestamps log datetime msec
7  no service password-encryption
8  service sequence-numbers
9  !
10 hostname HQ_CS3
11 !
12 boot-start-marker
13 boot-end-marker
14 !
15 enable secret 5 $1$vTJp$Y2wL0oVslvo0aBBNAr1oX0
16 !
17 username ins password 0 ins@lab
18 !
19 !
20 no aaa new-model
21 system mtu routing 1500
22 vtp mode transparent
23 ip routing
24 !
25 !
26 !
27 !
28 crypto pki trustpoint TP-self-signed-789190400
29 enrollment selfsigned
30 subject-name cn=IOS-Self-Signed-Certificate-789190400
31 revocation-check none
32 rsa-keypair TP-self-signed-789190400
33 !
34 !
35 crypto pki certificate chain TP-self-signed-789190400
36 certificate self-signed 01
37 3082023D 308201A6 A0030201 02020101 300D0609 2A864886 F70D0101 04050030
38 30312E30 2C060355 04031325 494F532D 53656C66 2D536967 6E65642D 43657274
39 69666963 6174652D 37383931 39303430 30301E17 0D393330 33303130 35343835
40 315A170D 32303031 30313030 30303030 5A303031 2E302C06 03550403 1325494F
41 532D5365 6C662D53 69676E65 642D4365 72746966 69636174 652D3738 39313930
42 34303030 819F300D 06092A86 4886F70D 01010105 0003818D 00308189 02818100
43 C6C5446B BBCF34FF 439D0799 2EB637D6 822843B1 3A8D9AE5 4E1BCE76 6BA2FC1D
44 2E4B00FE 98620634 368959FB 97A92D32 9128ED2B A06BAAA8 D597C7A2 83918ECB
45 0CFBCFA3 C5655F94 530C8875 DF278C94 37D7CDC4 50A60294 170E9EDE 42D9F5AF
46 4BB1C6EC D12E59BD 7B813469 2C2CE6E0 160347A3 B33953FF E1B41BBE 63B967EF
47 02030100 01A36730 65300F06 03551D13 0101FF04 05300301 01FF3012 0603551D

```

```
48 11040B30 09820748 515F4353 332E301F 0603551D 23041830 168014C9 52E60A9F
49 D61C6333 B57971FA 63F81D9E 1E6ED830 1D060355 1D0E0416 0414C952 E60A9FD6
50 1C6333B5 7971FA63 F81D9E1E 6ED8300D 06092A86 4886F70D 01010405 00038181
51 005EEE8C 4FD31148 0FDC9155 BFAE63D4 0C28666B 1B9B3504 3E0353AF 124EF810
52 1E13F6D9 5F080222 433F481F 82B2EC7D 564A5EFA 0693404A C1B2F33A 6421460A
53 D05C704A DCA0D681 8A3D3D22 956F4BFC CBEE4EAD 9A51EB53 802FF1E0 81DFCBF6
54 A8AF70AE 785BECB2 3D02114C 43138B7E CC472238 98501F4B 936FED21 C53F0293 D1
55 quit
56 !
57 !
58 !
59 spanning-tree mode pvst
60 spanning-tree extend system-id
61 !
62 vlan internal allocation policy ascending
63 !
64 vlan 99
65 name mgmt
66 !
67 vlan 100
68 name staff
69 !
70 vlan 150
71 name iwas
72 !
73 vlan 200
74 name students
75 !
76 !
77 !
78 !
79 interface Loopback100
80 ip address 172.16.25.3 255.255.255.0
81 ip ospf 1 area 0
82 !
83 interface Port-channel1
84 no switchport
85 ip address 172.16.254.9 255.255.255.252
86 ip ospf mtu-ignore
87 ip ospf 1 area 0
88 !
89 interface Port-channel2
90 no switchport
91 ip address 172.16.254.6 255.255.255.252
92 ip ospf mtu-ignore
93 ip ospf 1 area 0
94 !
95 interface Port-channel3
96 no switchport
97 ip address 172.16.254.21 255.255.255.252
98 ip ospf mtu-ignore
99 ip ospf 1 area 0
100 !
101 interface FastEthernet0/1
102 no switchport
103 no ip address
104 channel-group 1 mode on
105 !
106 interface FastEthernet0/2
107 no switchport
108 no ip address
109 channel-group 1 mode on
```

```
110 | !
111 | interface FastEthernet0/3
112 | no switchport
113 | no ip address
114 | channel-group 1 mode on
115 | !
116 | interface FastEthernet0/4
117 | no switchport
118 | no ip address
119 | channel-group 1 mode on
120 | !
121 | interface FastEthernet0/5
122 | no switchport
123 | no ip address
124 | channel-group 2 mode on
125 | !
126 | interface FastEthernet0/6
127 | no switchport
128 | no ip address
129 | channel-group 2 mode on
130 | !
131 | interface FastEthernet0/7
132 | no switchport
133 | no ip address
134 | channel-group 2 mode on
135 | !
136 | interface FastEthernet0/8
137 | no switchport
138 | no ip address
139 | channel-group 2 mode on
140 | !
141 | interface FastEthernet0/9
142 | !
143 | interface FastEthernet0/10
144 | !
145 | interface FastEthernet0/11
146 | !
147 | interface FastEthernet0/12
148 | !
149 | interface FastEthernet0/13
150 | no switchport
151 | no ip address
152 | channel-group 3 mode on
153 | !
154 | interface FastEthernet0/14
155 | no switchport
156 | no ip address
157 | channel-group 3 mode on
158 | !
159 | interface FastEthernet0/15
160 | no switchport
161 | no ip address
162 | channel-group 3 mode on
163 | !
164 | interface FastEthernet0/16
165 | no switchport
166 | no ip address
167 | channel-group 3 mode on
168 | !
169 | interface FastEthernet0/17
170 | !
171 | interface FastEthernet0/18
```

```

172 !
173 interface FastEthernet0/19
174 !
175 interface FastEthernet0/20
176 !
177 interface FastEthernet0/21
178 !
179 interface FastEthernet0/22
180 !
181 interface FastEthernet0/23
182 !
183 interface FastEthernet0/24
184 !
185 interface GigabitEthernet0/1
186 !
187 interface GigabitEthernet0/2
188 !
189 interface Vlan1
190   no ip address
191   shutdown
192 !
193 router ospf 1
194   log-adjacency-changes
195 !
196 ip classless
197 ip http server
198 ip http secure-server
199 !
200 !
201 ip sla enable reaction-alerts
202 !
203 snmp-server community public R0
204 snmp-server community private RW
205 !
206 !
207 line con 0
208 line vty 0 4
209   password cisco
210   login
211 line vty 5 15
212   password cisco
213   login
214 !
215 end

```

A.10.2. IP Interfaces

	Interface	IP-Address	OK?	Method	Status	Protocol
1	Vlan1	unassigned	YES	manual	administratively down	down
2	FastEthernet0/1	unassigned	YES	manual	up	up
3	FastEthernet0/2	unassigned	YES	manual	up	up
4	FastEthernet0/3	unassigned	YES	manual	up	up
5	FastEthernet0/4	unassigned	YES	manual	up	up
6	FastEthernet0/5	unassigned	YES	manual	up	up
7	FastEthernet0/6	unassigned	YES	manual	up	up
8	FastEthernet0/7	unassigned	YES	manual	up	up
9	FastEthernet0/8	unassigned	YES	manual	up	up
10	FastEthernet0/9	unassigned	YES	unset	down	down
11	FastEthernet0/10	unassigned	YES	unset	down	down
12	FastEthernet0/11	unassigned	YES	unset	down	down
13						

14	FastEthernet0/12	unassigned	YES	unset	down	down
15	FastEthernet0/13	unassigned	YES	manual	up	up
16	FastEthernet0/14	unassigned	YES	manual	up	up
17	FastEthernet0/15	unassigned	YES	manual	up	up
18	FastEthernet0/16	unassigned	YES	manual	up	up
19	FastEthernet0/17	unassigned	YES	unset	down	down
20	FastEthernet0/18	unassigned	YES	unset	down	down
21	FastEthernet0/19	unassigned	YES	unset	down	down
22	FastEthernet0/20	unassigned	YES	unset	down	down
23	FastEthernet0/21	unassigned	YES	unset	down	down
24	FastEthernet0/22	unassigned	YES	unset	down	down
25	FastEthernet0/23	unassigned	YES	unset	down	down
26	FastEthernet0/24	unassigned	YES	unset	down	down
27	GigabitEthernet0/1	unassigned	YES	unset	down	down
28	GigabitEthernet0/2	unassigned	YES	unset	down	down
29	Port-channel1	172.16.254.9	YES	manual	up	up
30	Port-channel2	172.16.254.6	YES	manual	up	up
31	Port-channel3	172.16.254.21	YES	manual	up	up
32	Loopback100	172.16.25.3	YES	manual	up	up

A.10.3. Interface Status

Port	Name	Status	Vlan	Duplex	Speed	Type
1	Fa0/1	connected	routed	a-full	a-100	10/100BaseTX
2	Fa0/2	connected	routed	a-full	a-100	10/100BaseTX
3	Fa0/3	connected	routed	a-full	a-100	10/100BaseTX
4	Fa0/4	connected	routed	a-full	a-100	10/100BaseTX
5	Fa0/5	connected	routed	a-full	a-100	10/100BaseTX
6	Fa0/6	connected	routed	a-full	a-100	10/100BaseTX
7	Fa0/7	connected	routed	a-full	a-100	10/100BaseTX
8	Fa0/8	connected	routed	a-full	a-100	10/100BaseTX
9	Fa0/9	notconnect	1	auto	auto	10/100BaseTX
10	Fa0/10	notconnect	1	auto	auto	10/100BaseTX
11	Fa0/11	notconnect	1	auto	auto	10/100BaseTX
12	Fa0/12	notconnect	1	auto	auto	10/100BaseTX
13	Fa0/13	connected	routed	a-full	a-100	10/100BaseTX
14	Fa0/14	connected	routed	a-full	a-100	10/100BaseTX
15	Fa0/15	connected	routed	a-full	a-100	10/100BaseTX
16	Fa0/16	connected	routed	a-full	a-100	10/100BaseTX
17	Fa0/17	notconnect	1	auto	auto	10/100BaseTX
18	Fa0/18	notconnect	1	auto	auto	10/100BaseTX
19	Fa0/19	notconnect	1	auto	auto	10/100BaseTX
20	Fa0/20	notconnect	1	auto	auto	10/100BaseTX
21	Fa0/21	notconnect	1	auto	auto	10/100BaseTX
22	Fa0/22	notconnect	1	auto	auto	10/100BaseTX
23	Fa0/23	notconnect	1	auto	auto	10/100BaseTX
24	Fa0/24	notconnect	1	auto	auto	10/100BaseTX
25	Gi0/1	notconnect	1	auto	auto	Not Present
26	Gi0/2	notconnect	1	auto	auto	Not Present
27	Po1	connected	routed	a-full	a-100	
28	Po2	connected	routed	a-full	a-100	
29	Po3	connected	routed	a-full	a-100	

A.10.4. Neighbors

1	Device ID	Local Intrfce	Holdtme	Capability	Platform	Port ID
2	HQ_CS4	Fas 0/4	140	R S I WS-C3560-	Fas 0/4	
3	HQ_CS4	Fas 0/2	170	R S I WS-C3560-	Fas 0/2	
4	HQ_CS4	Fas 0/1	170	R S I WS-C3560-	Fas 0/1	
5	HQ_DS3	Fas 0/16	160	R S I WS-C3560-	Fas 0/4	
6	HQ_DS3	Fas 0/15	160	R S I WS-C3560-	Fas 0/3	
7	HQ_DS3	Fas 0/14	160	R S I WS-C3560-	Fas 0/2	
8	HQ_DS3	Fas 0/13	153	R S I WS-C3560-	Fas 0/1	
9	HQ_CS4	Fas 0/3	153	R S I WS-C3560-	Fas 0/3	
10	HQ_CS1	Fas 0/5	140	R S I WS-C3560V	Fas 0/5	
11	HQ_CS1	Fas 0/8	129	R S I WS-C3560V	Fas 0/8	
12	HQ_CS1	Fas 0/7	129	R S I WS-C3560V	Fas 0/7	
13	HQ_CS1	Fas 0/6	153	R S I WS-C3560V	Fas 0/6	

A.11. HQ CS4

A.11.1. Running Configuration

```

1
2 !
3 version 12.2
4 no service pad
5 service timestamps debug datetime msec
6 service timestamps log datetime msec
7 no service password-encryption
8 service sequence-numbers
9 !
10 hostname HQ_CS4
11 !
12 boot-start-marker
13 boot-end-marker
14 !
15 enable secret 5 $1$N5nF$HEL..CSYKg7JJWvzQ3nmT.
16 !
17 username ins password 0 ins@lab
18 !
19 !
20 no aaa new-model
21 system mtu routing 1500
22 ip routing
23 !
24 !
25 !
26 !
27 crypto pki trustpoint TP-self-signed-802424960
28   enrollment selfsigned
29   subject-name cn=IOS-Self-Signed-Certificate-802424960
30   revocation-check none
31   rsakeypair TP-self-signed-802424960
32 !
33 crypto pki trustpoint TP-self-signed-802432128
34   enrollment selfsigned
35   subject-name cn=IOS-Self-Signed-Certificate-802432128
36   revocation-check none
37   rsakeypair TP-self-signed-802432128
38 !
39 !
40 crypto pki certificate chain TP-self-signed-802424960
41   certificate self-signed 01

```

```

42 3082023D 308201A6 A0030201 02020101 300D0609 2A864886 F70D0101 04050030
43 30312E30 2C060355 04031325 494F532D 53656C66 2D536967 6E65642D 43657274
44 69666963 6174652D 38303234 32343936 30301E17 0D393330 33303130 34333535
45 305A170D 32303031 30313030 30303030 5A303031 2E302C06 03550403 1325494F
46 532D5365 6C662D53 69676E65 642D4365 72746966 69636174 652D3830 32343234
47 39363030 819F300D 06092A86 4886F70D 01010105 0003818D 00308189 02818100
48 A9193D67 CE1F2E8A 7AB17D29 9971816E 22E047F8 2955A0D1 AD5C07B1 0F1E57B8
49 297A57E3 C9FB80F0 F4F23D41 D5BC46A8 89AF0D40 1635CEFC F5E11F87 299918FF
50 0F96B019 93ACF31B 25B150C5 5EAB53F0 896D3798 79654043 2C7D0198 038E1461
51 CF40C791 4672B925 F378404B 82044B68 2736E846 10BACD2B 32B6DA93 4C87F97D
52 02030100 01A36730 65300F06 03551D13 0101FF04 05300301 01FF3012 0603551D
53 11040B30 09820748 515F4353 342E301F 0603551D 23041830 168014E7 AA5F970C
54 25B6B81A 35D4F86C 77D83F5B 9C913330 1D060355 1D0E0416 0414E7AA 5F970C25
55 B6B81A35 D4F86C77 D83F5B9C 9133300D 06092A86 4886F70D 01010405 00038181
56 0077A6C0 DC369CBE 5624731D 5D458961 E5FAC002 CCF40AD5 620A07F6 6CF9AD29
57 0EE5B0B9 4AEA8804 33220F07 31159C38 2898D38B E236DD1 9ADACEFC 4FCD32D9
58 6A3B8351 8A5BBFA3 BB1DFA0C 63E93422 94290CE6 D8015255 7D7BF9FA AC8D5D4E
59 67D63E98 B31EA49E 2F79E42D 77F10414 A245B30D 49D95466 9873C600 EED03BBD 5B
60 quit
61 crypto pki certificate chain TP-self-signed-802432128
62 !
63 !
64 !
65 spanning-tree mode pvst
66 spanning-tree extend system-id
67 !
68 vlan internal allocation policy ascending
69 !
70 !
71 !
72 !
73 interface Loopback100
74 ip address 172.16.25.4 255.255.255.0
75 ip ospf 1 area 0
76 !
77 interface Port-channel1
78 no switchport
79 ip address 172.16.254.10 255.255.255.252
80 ip ospf mtu-ignore
81 ip ospf 1 area 0
82 !
83 interface Port-channel2
84 no switchport
85 bandwidth 10000
86 ip address 172.16.254.14 255.255.255.252
87 ip ospf mtu-ignore
88 ip ospf 1 area 0
89 speed 10
90 !
91 interface Port-channel3
92 !
93 interface Port-channel4
94 no switchport
95 ip address 172.16.254.17 255.255.255.252
96 ip ospf mtu-ignore
97 ip ospf 1 area 0
98 !
99 interface FastEthernet0/1
100 no switchport
101 no ip address
102 channel-group 1 mode on
103 !

```

```
104 interface FastEthernet0/2
105 no switchport
106 no ip address
107 channel-group 1 mode on
108 !
109 interface FastEthernet0/3
110 no switchport
111 no ip address
112 channel-group 1 mode on
113 !
114 interface FastEthernet0/4
115 no switchport
116 no ip address
117 channel-group 1 mode on
118 !
119 interface FastEthernet0/5
120 no switchport
121 no ip address
122 speed 10
123 channel-group 2 mode on
124 !
125 interface FastEthernet0/6
126 no switchport
127 no ip address
128 speed 10
129 channel-group 2 mode on
130 !
131 interface FastEthernet0/7
132 no switchport
133 no ip address
134 speed 10
135 channel-group 2 mode on
136 !
137 interface FastEthernet0/8
138 no switchport
139 no ip address
140 speed 10
141 channel-group 2 mode on
142 !
143 interface FastEthernet0/9
144 !
145 interface FastEthernet0/10
146 !
147 interface FastEthernet0/11
148 !
149 interface FastEthernet0/12
150 !
151 interface FastEthernet0/13
152 no switchport
153 no ip address
154 channel-group 4 mode on
155 !
156 interface FastEthernet0/14
157 no switchport
158 no ip address
159 channel-group 4 mode on
160 !
161 interface FastEthernet0/15
162 no switchport
163 no ip address
164 channel-group 4 mode on
165 !
```



```

166 interface FastEthernet0/16
167   no switchport
168   no ip address
169   channel-group 4 mode on
170   !
171 interface FastEthernet0/17
172   !
173 interface FastEthernet0/18
174   !
175 interface FastEthernet0/19
176   !
177 interface FastEthernet0/20
178   !
179 interface FastEthernet0/21
180   !
181 interface FastEthernet0/22
182   !
183 interface FastEthernet0/23
184   !
185 interface FastEthernet0/24
186   !
187 interface GigabitEthernet0/1
188   !
189 interface GigabitEthernet0/2
190   !
191 interface Vlan1
192   no ip address
193   shutdown
194   !
195 router ospf 1
196   log-adjacency-changes
197   !
198 ip classless
199 ip http server
200 ip http secure-server
201   !
202   !
203 ip sla enable reaction-alerts
204   !
205 snmp-server community public R0
206 snmp-server community private RW
207   !
208   !
209 line con 0
210 line vty 0 4
211   password cisco
212   login
213 line vty 5 15
214   password cisco
215   login
216   !
217 end

```

A.11.2. IP Interfaces

	Interface	IP-Address	OK?	Method	Status	Protocol
1	Vlan1	unassigned	YES	manual	administratively down	down
2	FastEthernet0/1	unassigned	YES	manual	up	up
3	FastEthernet0/2	unassigned	YES	manual	up	up
4	FastEthernet0/3	unassigned	YES	manual	up	up
5						

6	FastEthernet0/4	unassigned	YES	manual	up	up
7	FastEthernet0/5	unassigned	YES	manual	up	up
8	FastEthernet0/6	unassigned	YES	manual	up	up
9	FastEthernet0/7	unassigned	YES	manual	up	up
10	FastEthernet0/8	unassigned	YES	manual	up	up
11	FastEthernet0/9	unassigned	YES	unset	down	down
12	FastEthernet0/10	unassigned	YES	unset	down	down
13	FastEthernet0/11	unassigned	YES	unset	down	down
14	FastEthernet0/12	unassigned	YES	unset	down	down
15	FastEthernet0/13	unassigned	YES	manual	up	up
16	FastEthernet0/14	unassigned	YES	manual	up	up
17	FastEthernet0/15	unassigned	YES	manual	up	up
18	FastEthernet0/16	unassigned	YES	manual	up	up
19	FastEthernet0/17	unassigned	YES	unset	down	down
20	FastEthernet0/18	unassigned	YES	unset	down	down
21	FastEthernet0/19	unassigned	YES	unset	down	down
22	FastEthernet0/20	unassigned	YES	unset	down	down
23	FastEthernet0/21	unassigned	YES	unset	down	down
24	FastEthernet0/22	unassigned	YES	unset	down	down
25	FastEthernet0/23	unassigned	YES	unset	down	down
26	FastEthernet0/24	unassigned	YES	unset	down	down
27	GigabitEthernet0/1	unassigned	YES	unset	down	down
28	GigabitEthernet0/2	unassigned	YES	unset	down	down
29	Port-channel1	172.16.254.10	YES	manual	up	up
30	Port-channel2	172.16.254.14	YES	manual	up	up
31	Port-channel3	unassigned	YES	unset	down	down
32	Port-channel4	172.16.254.17	YES	manual	up	up
33	Loopback100	172.16.25.4	YES	manual	up	up

A.11.3. Interface Status

Port	Name	Status	Vlan	Duplex	Speed	Type
1	Fa0/1	connected	routed	a-full	a-100	10/100BaseTX
2	Fa0/2	connected	routed	a-full	a-100	10/100BaseTX
3	Fa0/3	connected	routed	a-full	a-100	10/100BaseTX
4	Fa0/4	connected	routed	a-full	a-100	10/100BaseTX
5	Fa0/5	connected	routed	a-full	10	10/100BaseTX
6	Fa0/6	connected	routed	a-full	10	10/100BaseTX
7	Fa0/7	connected	routed	a-full	10	10/100BaseTX
8	Fa0/8	connected	routed	a-full	10	10/100BaseTX
9	Fa0/9	notconnect	1	auto	auto	10/100BaseTX
10	Fa0/10	notconnect	1	auto	auto	10/100BaseTX
11	Fa0/11	notconnect	1	auto	auto	10/100BaseTX
12	Fa0/12	notconnect	1	auto	auto	10/100BaseTX
13	Fa0/13	connected	routed	a-full	a-100	10/100BaseTX
14	Fa0/14	connected	routed	a-full	a-100	10/100BaseTX
15	Fa0/15	connected	routed	a-full	a-100	10/100BaseTX
16	Fa0/16	connected	routed	a-full	a-100	10/100BaseTX
17	Fa0/17	notconnect	1	auto	auto	10/100BaseTX
18	Fa0/18	notconnect	1	auto	auto	10/100BaseTX
19	Fa0/19	notconnect	1	auto	auto	10/100BaseTX
20	Fa0/20	notconnect	1	auto	auto	10/100BaseTX
21	Fa0/21	notconnect	1	auto	auto	10/100BaseTX
22	Fa0/21	notconnect	1	auto	auto	10/100BaseTX
23						
Port	Name	Status	Vlan	Duplex	Speed	Type
24	Fa0/22	notconnect	1	auto	auto	10/100BaseTX
25	Fa0/23	notconnect	1	auto	auto	10/100BaseTX
26	Fa0/24	notconnect	1	auto	auto	10/100BaseTX
27	Gi0/1	notconnect	1	auto	auto	Not Present
28	Gi0/2	notconnect	1	auto	auto	Not Present
29						

```

30 Po1                connected routed a-full a-100
31 Po2                connected routed a-full 10
32 Po3                notconnect unassigned auto auto
33 Po4                connected routed a-full a-100

```

A.11.4. Neighbors

	Device ID	Local Intrfce	Holdtme	Capability	Platform	Port	ID
1	HQ_DS3	Fas 0/16	156	R S I	WS-C3560-	Fas 0/8	
2	HQ_DS3	Fas 0/15	156	R S I	WS-C3560-	Fas 0/7	
3	HQ_DS3	Fas 0/14	156	R S I	WS-C3560-	Fas 0/6	
4	HQ_DS3	Fas 0/13	156	R S I	WS-C3560-	Fas 0/5	
5	HQ_CS2	Fas 0/8	140	R S I	WS-C3560V	Fas 0/8	
6	HQ_CS2	Fas 0/7	140	R S I	WS-C3560V	Fas 0/7	
7	HQ_CS2	Fas 0/6	140	R S I	WS-C3560V	Fas 0/6	
8	HQ_CS2	Fas 0/5	140	R S I	WS-C3560V	Fas 0/5	
9	HQ_CS3	Fas 0/3	148	R S I	WS-C3560-	Fas 0/3	
10	HQ_CS3	Fas 0/4	148	R S I	WS-C3560-	Fas 0/4	
11	HQ_CS3	Fas 0/2	148	R S I	WS-C3560-	Fas 0/2	
12	HQ_CS3	Fas 0/1	148	R S I	WS-C3560-	Fas 0/1	
13							

A.12. HQ DS1

A.12.1. Running Configuration

```

1  !
2  !
3  ! Last configuration change at 07:40:47 UTC Mon Mar 1 1993
4  !
5  version 15.0
6  no service pad
7  service timestamps debug datetime msec
8  service timestamps log datetime msec
9  no service password-encryption
10 service sequence-numbers
11 !
12 hostname HQ_DS1
13 !
14 boot-start-marker
15 boot-end-marker
16 !
17 enable secret 5 $1$ajf9$7aDklFhjLgZzrC095VIDm0
18 !
19 username cisco password 0 cisco
20 username ins password 0 ins@lab
21 aaa new-model
22 !
23 !
24 !
25 !
26 !
27 !
28 !
29 !
30 aaa session-id common
31 system mtu routing 1500
32 ip routing
33 no ip domain-lookup

```

```
34 ip dhcp excluded-address 172.16.16.1
35 ip dhcp excluded-address 172.16.16.10 172.16.16.12
36 ip dhcp excluded-address 172.16.17.1
37 ip dhcp excluded-address 172.16.17.10 172.16.17.12
38 ip dhcp excluded-address 172.16.18.250 172.16.18.254
39 ip dhcp excluded-address 172.16.18.10 172.16.18.12
40 ip dhcp excluded-address 172.16.19.250 172.16.19.254
41 ip dhcp excluded-address 172.16.19.10 172.16.19.12
42 !
43 ip dhcp pool IT
44   network 172.16.16.0 255.255.255.0
45   default-router 172.16.16.1
46   !
47 ip dhcp pool SERVER
48   network 172.16.17.0 255.255.255.0
49   default-router 172.16.17.1
50   !
51 ip dhcp pool MARKETING
52   network 172.16.18.0 255.255.255.0
53   default-router 172.16.18.254
54   !
55 ip dhcp pool SALES
56   network 172.16.19.0 255.255.255.0
57   default-router 172.16.19.254
58   !
59   !
60   !
61   !
62 crypto pki trustpoint HTTPS_SS_CERT_KEYPAIR
63   enrollment selfsigned
64   serial-number
65   revocation-check none
66   rsa-keypair HTTPS_SS_CERT_KEYPAIR
67   !
68   !
69 crypto pki certificate chain HTTPS_SS_CERT_KEYPAIR
70   certificate self-signed 01
71   quit
72   !
73   !
74   !
75   !
76   !
77 spanning-tree mode pvst
78 spanning-tree extend system-id
79   !
80 vlan internal allocation policy ascending
81   !
82   !
83   !
84   !
85   !
86   !
87   !
88   !
89   !
90   !
91   !
92   !
93   !
94   !
95 interface Loopback100
```

```
96 ip address 172.16.25.5 255.255.255.0
97 ip ospf 1 area 0
98 !
99 interface Port-channel1
100 switchport trunk encapsulation dot1q
101 switchport mode trunk
102 !
103 interface Port-channel2
104 switchport trunk encapsulation dot1q
105 switchport mode trunk
106 !
107 interface Port-channel3
108 no switchport
109 ip address 172.16.254.38 255.255.255.248
110 ip ospf mtu-ignore
111 ip ospf 1 area 0
112 !
113 interface Port-channel4
114 switchport trunk encapsulation dot1q
115 switchport mode trunk
116 !
117 interface Port-channel5
118 switchport trunk encapsulation dot1q
119 switchport mode trunk
120 !
121 interface Port-channel6
122 switchport trunk encapsulation dot1q
123 switchport mode trunk
124 !
125 interface FastEthernet0/1
126 no switchport
127 no ip address
128 channel-group 3 mode on
129 !
130 interface FastEthernet0/2
131 no switchport
132 no ip address
133 channel-group 3 mode on
134 !
135 interface FastEthernet0/3
136 no switchport
137 no ip address
138 channel-group 3 mode on
139 !
140 interface FastEthernet0/4
141 no switchport
142 no ip address
143 channel-group 3 mode on
144 !
145 interface FastEthernet0/5
146 switchport trunk encapsulation dot1q
147 switchport mode trunk
148 channel-group 5 mode on
149 !
150 interface FastEthernet0/6
151 switchport trunk encapsulation dot1q
152 switchport mode trunk
153 channel-group 5 mode on
154 !
155 interface FastEthernet0/7
156 switchport trunk encapsulation dot1q
157 switchport mode trunk
```

```
158 | !
159 | interface FastEthernet0/8
160 |   switchport trunk encapsulation dot1q
161 |   switchport mode trunk
162 | !
163 | interface FastEthernet0/9
164 |   switchport trunk encapsulation dot1q
165 |   switchport mode trunk
166 | !
167 | interface FastEthernet0/10
168 |   switchport trunk encapsulation dot1q
169 |   switchport mode trunk
170 | !
171 | interface FastEthernet0/11
172 |   switchport trunk encapsulation dot1q
173 |   switchport mode trunk
174 |   channel-group 4 mode on
175 | !
176 | interface FastEthernet0/12
177 |   switchport trunk encapsulation dot1q
178 |   switchport mode trunk
179 |   channel-group 4 mode on
180 | !
181 | interface FastEthernet0/13
182 |   switchport trunk encapsulation dot1q
183 |   switchport mode trunk
184 | !
185 | interface FastEthernet0/14
186 |   switchport trunk encapsulation dot1q
187 |   switchport mode trunk
188 | !
189 | interface FastEthernet0/15
190 |   switchport trunk encapsulation dot1q
191 |   switchport mode trunk
192 |   channel-group 6 mode on
193 | !
194 | interface FastEthernet0/16
195 |   switchport trunk encapsulation dot1q
196 |   switchport mode trunk
197 |   channel-group 6 mode on
198 | !
199 | interface FastEthernet0/17
200 | !
201 | interface FastEthernet0/18
202 | !
203 | interface FastEthernet0/19
204 | !
205 | interface FastEthernet0/20
206 | !
207 | interface FastEthernet0/21
208 |   switchport trunk encapsulation dot1q
209 |   switchport mode trunk
210 |   channel-group 1 mode on
211 | !
212 | interface FastEthernet0/22
213 |   switchport trunk encapsulation dot1q
214 |   switchport mode trunk
215 |   channel-group 1 mode on
216 | !
217 | interface FastEthernet0/23
218 |   switchport trunk encapsulation dot1q
219 |   switchport mode trunk
```

```
220 channel-group 1 mode on
221 !
222 interface FastEthernet0/24
223 switchport trunk encapsulation dot1q
224 switchport mode trunk
225 channel-group 1 mode on
226 !
227 interface GigabitEthernet0/1
228 !
229 interface GigabitEthernet0/2
230 !
231 interface Vlan1
232 no ip address
233 shutdown
234 !
235 interface Vlan21
236 ip address 172.16.16.1 255.255.255.0
237 standby 40 preempt
238 ip ospf mtu-ignore
239 ip ospf 1 area 0
240 !
241 interface Vlan30
242 ip address 172.16.17.1 255.255.255.0
243 ip ospf mtu-ignore
244 ip ospf 1 area 0
245 !
246 interface Vlan40
247 ip address 172.16.18.252 255.255.255.0
248 standby 40 ip 172.16.18.254
249 standby 40 priority 150
250 standby 40 preempt
251 ip ospf mtu-ignore
252 ip ospf 1 area 0
253 !
254 interface Vlan41
255 ip address 172.16.19.252 255.255.255.0
256 standby 41 ip 172.16.19.254
257 standby 41 preempt
258 ip ospf mtu-ignore
259 ip ospf 1 area 0
260 !
261 interface Vlan100
262 ip address 172.16.20.1 255.255.255.0
263 ip ospf mtu-ignore
264 ip ospf 1 area 0
265 !
266 router ospf 1
267 !
268 ip http server
269 ip http secure-server
270 !
271 !
272 ip sla enable reaction-alerts
273 snmp-server community public R0
274 snmp-server community private RW
275 !
276 !
277 !
278 !
279 line con 0
280 line vty 0 4
281 password cisco
```

```

282 line vty 5 15
283 password cisco
284 !
285 end

```

A.12.2. IP Interfaces

Interface	IP-Address	OK?	Method	Status	Protocol
Vlan1	unassigned	YES	unset	administratively down	down
Vlan21	172.16.16.1	YES	manual	down	down
Vlan30	172.16.17.1	YES	manual	up	up
Vlan40	172.16.18.252	YES	manual	up	up
Vlan41	172.16.19.252	YES	manual	up	up
Vlan100	172.16.20.1	YES	manual	down	down
FastEthernet0/1	unassigned	YES	manual	up	up
FastEthernet0/2	unassigned	YES	manual	up	up
FastEthernet0/3	unassigned	YES	manual	up	up
FastEthernet0/4	unassigned	YES	manual	up	up
FastEthernet0/5	unassigned	YES	unset	up	up
FastEthernet0/6	unassigned	YES	unset	up	up
FastEthernet0/7	unassigned	YES	unset	up	up
FastEthernet0/8	unassigned	YES	unset	up	up
FastEthernet0/9	unassigned	YES	unset	up	up
FastEthernet0/10	unassigned	YES	unset	down	down
FastEthernet0/11	unassigned	YES	unset	up	up
FastEthernet0/12	unassigned	YES	unset	up	up
FastEthernet0/13	unassigned	YES	unset	up	up
FastEthernet0/14	unassigned	YES	unset	up	up
FastEthernet0/15	unassigned	YES	unset	down	down
FastEthernet0/16	unassigned	YES	unset	down	down
FastEthernet0/17	unassigned	YES	unset	down	down
FastEthernet0/18	unassigned	YES	unset	down	down
FastEthernet0/19	unassigned	YES	unset	down	down
FastEthernet0/20	unassigned	YES	unset	down	down
FastEthernet0/21	unassigned	YES	unset	down	down
FastEthernet0/22	unassigned	YES	unset	down	down
FastEthernet0/23	unassigned	YES	unset	down	down
FastEthernet0/24	unassigned	YES	unset	down	down
GigabitEthernet0/1	unassigned	YES	unset	down	down
GigabitEthernet0/2	unassigned	YES	unset	down	down
Port-channel1	unassigned	YES	unset	down	down
Port-channel2	unassigned	YES	unset	down	down
Port-channel3	172.16.254.38	YES	manual	up	up
Port-channel4	unassigned	YES	unset	up	up
Port-channel5	unassigned	YES	unset	up	up
Port-channel6	unassigned	YES	unset	down	down
Loopback100	172.16.25.5	YES	manual	up	up

A.12.3. Interface Status

Port	Name	Status	Vlan	Duplex	Speed	Type
Fa0/1		connected	routed	a-full	a-10	10/100BaseTX
Fa0/2		connected	routed	a-full	a-10	10/100BaseTX
Fa0/3		connected	routed	a-full	a-10	10/100BaseTX
Fa0/4		connected	routed	a-full	a-10	10/100BaseTX
Fa0/5		connected	trunk	a-full	a-100	10/100BaseTX
Fa0/6		connected	trunk	a-full	a-100	10/100BaseTX
Fa0/7		connected	trunk	a-full	a-100	10/100BaseTX


```

9 Fa0/8          connected trunk    a-full a-100 10/100BaseTX
10 Fa0/9          connected trunk    a-full a-100 10/100BaseTX
11 Fa0/10         notconnect 1      auto auto 10/100BaseTX
12 Fa0/11         connected trunk    a-full a-100 10/100BaseTX
13 Fa0/12         connected trunk    a-full a-100 10/100BaseTX
14 Fa0/13         connected trunk    a-full a-100 10/100BaseTX
15 Fa0/14         connected trunk    a-full a-100 10/100BaseTX
16 Fa0/15         notconnect 1      auto auto 10/100BaseTX
17 Fa0/16         notconnect 1      auto auto 10/100BaseTX
18 Fa0/17         notconnect 1      auto auto 10/100BaseTX
19 Fa0/18         notconnect 1      auto auto 10/100BaseTX
20
21 Auto 10/100BaseTX
22 Fa0/20         notconnect 1      auto auto 10/100BaseTX
23 Fa0/21         notconnect 1      auto auto 10/100BaseTX
24
25 Port  Name      Status  Vlan  Duplex Speed Type
26 Fa0/22         notconnect 1      auto auto 10/100BaseTX
27 Fa0/23         notconnect 1      auto auto 10/100BaseTX
28 Fa0/24         notconnect 1      auto auto 10/100BaseTX
29 Gi0/1          notconnect 1      auto auto Not Present
30 Gi0/2          notconnect 1      auto auto Not Present
31 Po1            notconnect unassigned auto auto
32 Po2            notconnect unassigned auto auto
33 Po3            connected routed  a-full a-10
34 Po4            connected trunk  a-full a-100
35 Po5            connected trunk  a-full a-100
36 Po6            notconnect unassigned auto auto
37 HQ_DS1#

```

A.12.4. Neighbors

```

1 Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
2                   S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone,
3                   D - Remote, C - CVTA, M - Two-port Mac Relay
4
5 Device ID      Local Intrfce Holdtme Capability Platform Port ID
6 HQ_AS4        Fas 0/5      163      S I WS-C2960- Fas 0/3
7 HQ_AS4        Fas 0/6      126      S I WS-C2960- Fas 0/4
8 HQ_AS5        Fas 0/8      126      S I WS-C2960- Fas 0/4
9 HQ_AS5        Fas 0/7      126      S I WS-C2960- Fas 0/3
10 HQ_AS1        Fas 0/9      126      S I WS-C3560- Fas 0/1
11 HQ_AS2        Fas 0/12     127      S I WS-C3560- Fas 0/2
12 HQ_AS2        Fas 0/11     127      S I WS-C3560- Fas 0/1
13 HQ_CS1        Fas 0/4      162      R S I WS-C3560V Fas 0/16
14 HQ_CS1        Fas 0/3      162      R S I WS-C3560V Fas 0/15
15 HQ_CS1        Fas 0/2      162      R S I WS-C3560V Fas 0/14
16 HQ_CS1        Fas 0/1      162      R S I WS-C3560V Fas 0/13
17 HQ_AS3        Fas 0/14     126      S I WS-C2960- Fas 0/2
18 HQ_AS3        Fas 0/13     126      S I WS-C2960- Fas 0/1
19 HQ_DS1#

```

A.13. HQ DS2

A.13.1. Running Configuration

```

1
2 !

```

```
3 | ! Last configuration change at 08:47:52 UTC Mon Mar 1 1993
4 |
5 | version 15.0
6 | no service pad
7 | service timestamps debug datetime msec
8 | service timestamps log datetime msec
9 | no service password-encryption
10 | service sequence-numbers
11 |
12 | hostname HQ_DS2
13 |
14 | boot-start-marker
15 | boot-end-marker
16 |
17 | enable secret 5 $1$Gfma$G0lb8g0YFbxMJ8FjtkmpF/
18 |
19 | username ins password 0 ins@lab
20 | no aaa new-model
21 | system mtu routing 1504
22 | ip routing
23 | no ip domain-lookup
24 | ip dhcp excluded-address 172.16.18.250 172.16.18.254
25 | ip dhcp excluded-address 172.16.18.10 172.16.18.12
26 | ip dhcp excluded-address 172.16.19.250 172.16.19.254
27 | ip dhcp excluded-address 172.16.19.10 172.16.19.12
28 |
29 | ip dhcp pool MARKETING
30 |   network 172.16.18.0 255.255.255.0
31 |   default-router 172.16.18.254
32 |
33 | ip dhcp pool SALES
34 |   network 172.16.19.0 255.255.255.0
35 |   default-router 172.16.19.254
36 |
37 |
38 |
39 |
40 | crypto pki trustpoint HTTPS_SS_CERT_KEYPAIR
41 |   enrollment selfsigned
42 |   serial-number
43 |   revocation-check none
44 |   rsa-keypair HTTPS_SS_CERT_KEYPAIR
45 |
46 |
47 | crypto pki certificate chain HTTPS_SS_CERT_KEYPAIR
48 |   certificate self-signed 01
49 |     quit
50 |
51 |
52 |
53 |
54 |
55 | spanning-tree mode pvst
56 | spanning-tree extend system-id
57 |
58 | vlan internal allocation policy ascending
59 |
60 |
61 |
62 |
63 |
64 |
```

```
65 | !
66 | !
67 | !
68 | !
69 | !
70 | !
71 | !
72 | !
73 | interface Loopback100
74 | ip address 172.16.25.6 255.255.255.0
75 | ip ospf 1 area 0
76 | !
77 | interface Port-channel1
78 | switchport trunk encapsulation dot1q
79 | switchport mode trunk
80 | !
81 | interface Port-channel3
82 | no switchport
83 | ip address 172.16.254.49 255.255.255.248
84 | ip ospf mtu-ignore
85 | ip ospf 1 area 0
86 | !
87 | interface Port-channel4
88 | no switchport
89 | ip address 172.16.254.42 255.255.255.248
90 | ip ospf mtu-ignore
91 | ip ospf 1 area 0
92 | !
93 | interface FastEthernet0/1
94 | no switchport
95 | no ip address
96 | channel-group 3 mode on
97 | !
98 | interface FastEthernet0/2
99 | no switchport
100 | no ip address
101 | channel-group 3 mode on
102 | !
103 | interface FastEthernet0/3
104 | no switchport
105 | no ip address
106 | channel-group 3 mode on
107 | !
108 | interface FastEthernet0/4
109 | no switchport
110 | no ip address
111 | channel-group 3 mode on
112 | !
113 | interface FastEthernet0/5
114 | no switchport
115 | no ip address
116 | channel-group 4 mode on
117 | !
118 | interface FastEthernet0/6
119 | no switchport
120 | no ip address
121 | channel-group 4 mode on
122 | !
123 | interface FastEthernet0/7
124 | no switchport
125 | no ip address
126 | channel-group 4 mode on
```

```
127 |  
128 | interface FastEthernet0/8  
129 |   no switchport  
130 |   no ip address  
131 |   channel-group 4 mode on  
132 |  
133 | interface FastEthernet0/9  
134 |  
135 | interface FastEthernet0/10  
136 |  
137 | interface FastEthernet0/11  
138 |  
139 | interface FastEthernet0/12  
140 |  
141 | interface FastEthernet0/13  
142 |  
143 | interface FastEthernet0/14  
144 |  
145 | interface FastEthernet0/15  
146 |  
147 | interface FastEthernet0/16  
148 |  
149 | interface FastEthernet0/17  
150 |  
151 | interface FastEthernet0/18  
152 |  
153 | interface FastEthernet0/19  
154 |  
155 | interface FastEthernet0/20  
156 |  
157 | interface FastEthernet0/21  
158 |   switchport trunk encapsulation dot1q  
159 |   switchport mode trunk  
160 |   channel-group 1 mode on  
161 |  
162 | interface FastEthernet0/22  
163 |   switchport trunk encapsulation dot1q  
164 |   switchport mode trunk  
165 |   channel-group 1 mode on  
166 |  
167 | interface FastEthernet0/23  
168 |   switchport trunk encapsulation dot1q  
169 |   switchport mode trunk  
170 |   channel-group 1 mode on  
171 |  
172 | interface FastEthernet0/24  
173 |   switchport trunk encapsulation dot1q  
174 |   switchport mode trunk  
175 |   channel-group 1 mode on  
176 |  
177 | interface GigabitEthernet0/1  
178 |  
179 | interface GigabitEthernet0/2  
180 |  
181 | interface Vlan1  
182 |   no ip address  
183 |   shutdown  
184 |  
185 | interface Vlan21  
186 |   no ip address  
187 |   ip ospf mtu-ignore  
188 |  
189 |
```

```

189 interface Vlan30
190 no ip address
191 ip ospf mtu-ignore
192 !
193 interface Vlan40
194 ip address 172.16.18.253 255.255.255.0
195 standby 40 ip 172.16.18.254
196 standby 40 preempt
197 ip ospf mtu-ignore
198 ip ospf 1 area 0
199 !
200 interface Vlan41
201 ip address 172.16.19.253 255.255.255.0
202 standby 41 ip 172.16.19.254
203 standby 41 priority 150
204 standby 41 preempt
205 ip ospf 1 area 0
206 !
207 interface Vlan100
208 ip address 172.16.20.2 255.255.255.0
209 ip ospf mtu-ignore
210 ip ospf 1 area 0
211 !
212 router ospf 1
213 !
214 ip http server
215 ip http secure-server
216 !
217 !
218 ip sla enable reaction-alerts
219 snmp-server community public R0
220 snmp-server community private RW
221 !
222 !
223 line con 0
224 line vty 0 4
225 password cisco
226 login
227 line vty 5 15
228 password cisco
229 login
230 !
231 end

```

A.13.2. IP Interfaces

	Interface	IP-Address	OK?	Method	Status	Protocol
1	Vlan1	unassigned	YES	unset	administratively down	down
2	Vlan21	unassigned	YES	unset	down	down
3	Vlan30	unassigned	YES	unset	up	up
4	Vlan40	172.16.18.253	YES	manual	up	up
5	Vlan41	172.16.19.253	YES	manual	up	up
6	Vlan100	172.16.20.2	YES	manual	down	down
7	FastEthernet0/1	unassigned	YES	manual	up	up
8	FastEthernet0/2	unassigned	YES	manual	up	up
9	FastEthernet0/3	unassigned	YES	manual	up	up
10	FastEthernet0/4	unassigned	YES	manual	up	up
11	FastEthernet0/5	unassigned	YES	manual	up	up
12	FastEthernet0/6	unassigned	YES	manual	up	up
13	FastEthernet0/7	unassigned	YES	manual	up	up
14						

15	FastEthernet0/8	unassigned	YES	manual	up	up
16	FastEthernet0/9	unassigned	YES	unset	up	up
17	FastEthernet0/10	unassigned	YES	unset	up	up
18	FastEthernet0/11	unassigned	YES	unset	up	up
19	FastEthernet0/12	unassigned	YES	unset	up	up
20	FastEthernet0/13	unassigned	YES	unset	up	up
21	FastEthernet0/14	unassigned	YES	unset	up	up
22	FastEthernet0/15	unassigned	YES	unset	down	down
23	FastEthernet0/16	unassigned	YES	unset	down	down
24	FastEthernet0/17	unassigned	YES	unset	down	down
25	FastEthernet0/18	unassigned	YES	unset	down	down
26	FastEthernet0/19	unassigned	YES	unset	down	down
27	FastEthernet0/20	unassigned	YES	unset	down	down
28	FastEthernet0/21	unassigned	YES	unset	down	down
29	FastEthernet0/22	unassigned	YES	unset	down	down
30	FastEthernet0/23	unassigned	YES	unset	down	down
31	FastEthernet0/24	unassigned	YES	unset	down	down
32	GigabitEthernet0/1	unassigned	YES	unset	down	down
33	GigabitEthernet0/2	unassigned	YES	unset	down	down
34	Port-channel1	unassigned	YES	unset	down	down
35	Port-channel3	172.16.254.49	YES	manual	up	up
36	Port-channel4	172.16.254.42	YES	manual	up	up
37	Loopback100	172.16.25.6	YES	manual	up	up

A.13.3. Interface Status

Port	Name	Status	Vlan	Duplex	Speed	Type
1	Fa0/1	connected	routed	a-full	a-100	10/100BaseTX
2	Fa0/2	connected	routed	a-full	a-100	10/100BaseTX
4	Fa0/3	connected	routed	a-full	a-100	10/100BaseTX
5	Fa0/4	connected	routed	a-full	a-100	10/100BaseTX
6	Fa0/5	connected	routed	a-half	a-100	10/100BaseTX
7	Fa0/6	connected	routed	a-half	a-100	10/100BaseTX
8	Fa0/7	connected	routed	a-half	a-100	10/100BaseTX
9	Fa0/8	connected	routed	a-half	a-100	10/100BaseTX
10	Fa0/9	connected	trunk	a-full	a-100	10/100BaseTX
11	Fa0/10	connected	trunk	a-full	a-100	10/100BaseTX
12	Fa0/11	connected	trunk	a-full	a-100	10/100BaseTX
13	Fa0/12	connected	trunk	a-full	a-100	10/100BaseTX
14	Fa0/13	connected	trunk	a-full	a-100	10/100BaseTX
15	Fa0/14	connected	trunk	a-full	a-100	10/100BaseTX
16	Fa0/15	notconnect	1	auto	auto	10/100BaseTX
17	Fa0/16	notconnect	1	auto	auto	10/100BaseTX
18	Fa0/17	notconnect	1	auto	auto	10/100BaseTX
19	Fa0/18	notconnect	1	auto	auto	10/100BaseTX
20	Fa0/19	notconnect	1	auto	auto	10/100BaseTX
21	Fa0/20	notconnect	1	auto	auto	10/100BaseTX
22	Fa0/21	err-disabled	1	auto	auto	10/100BaseTX
23						
Port	Name	Status	Vlan	Duplex	Speed	Type
24	Fa0/22	err-disabled	1	auto	auto	10/100BaseTX
25	Fa0/23	err-disabled	1	auto	auto	10/100BaseTX
26	Fa0/24	err-disabled	1	auto	auto	10/100BaseTX
28	Gi0/1	notconnect	1	auto	auto	Not Present
29	Gi0/2	notconnect	1	auto	auto	Not Present
30	Po1	err-disabled	1	auto	auto	
31	Po3	connected	routed	a-full	a-100	
32	Po4	connected	routed	a-half	a-100	

A.13.4. Neighbors

	Device ID	Local Intrfce	Holdtme	Capability	Platform	Port ID
1	HQ_AS4	Fas 0/13	166	S I	WS-C2960-	Fas 0/1
2	HQ_AS4	Fas 0/14	166	S I	WS-C2960-	Fas 0/2
3	HQ_AS5	Fas 0/11	158	S I	WS-C2960-	Fas 0/1
4	HQ_AS5	Fas 0/12	158	S I	WS-C2960-	Fas 0/2
5	HQ_AS6	Fas 0/9	133	S I	WS-C2960-	Fas 0/1
6	HQ_AS6	Fas 0/10	133	S I	WS-C2960-	Fas 0/2
7	HQ_CS2	Fas 0/1	123	R S I	WS-C3560V	Fas 0/13
8	HQ_CS2	Fas 0/4	123	R S I	WS-C3560V	Fas 0/16
9	HQ_CS2	Fas 0/3	123	R S I	WS-C3560V	Fas 0/15
10	HQ_CS2	Fas 0/2	123	R S I	WS-C3560V	Fas 0/14
11	HQ_CS1	Fas 0/8	169	R S I	WS-C3560V	Fas 0/20
12	HQ_CS1	Fas 0/7	169	R S I	WS-C3560V	Fas 0/19
13	HQ_CS1	Fas 0/6	169	R S I	WS-C3560V	Fas 0/18
14	HQ_CS1	Fas 0/5	169	R S I	WS-C3560V	Fas 0/17

A.14. HQ DS3

A.14.1. Running Configuration

```

1  !
2  !
3  version 12.2
4  no service pad
5  service timestamps debug datetime msec
6  service timestamps log datetime msec
7  no service password-encryption
8  service sequence-numbers
9  !
10 hostname HQ_DS3
11 !
12 boot-start-marker
13 boot-end-marker
14 !
15 enable secret 5 $1$ys7e$..Pxw.v7DcwVg.V9ngdUH0
16 !
17 username ins password 0 ins@lab
18 !
19 !
20 no aaa new-model
21 system mtu routing 1500
22 ip routing
23 ip dhcp excluded-address 172.16.1.1
24 ip dhcp excluded-address 172.16.1.10 172.16.1.12
25 ip dhcp excluded-address 172.16.2.1
26 ip dhcp excluded-address 172.16.2.10 172.16.2.12
27 ip dhcp excluded-address 172.16.3.1
28 ip dhcp excluded-address 172.16.3.10 172.16.3.12
29 ip dhcp excluded-address 172.16.4.1
30 ip dhcp excluded-address 172.16.4.10 172.16.4.12
31 !
32 ip dhcp pool HR
33     network 172.16.1.0 255.255.255.0
34     default-router 172.16.1.1
35 !
36 ip dhcp pool Engineering
37     network 172.16.2.0 255.255.255.0

```

```

38  default-router 172.16.2.1
39  !
40  ip dhcp pool Production
41      network 172.16.3.0 255.255.255.0
42  default-router 172.16.3.1
43  !
44  ip dhcp pool Finance
45      network 172.16.4.0 255.255.255.0
46  default-router 172.16.4.1
47  !
48  !
49  !
50  !
51  crypto pki trustpoint TP-self-signed-802439168
52      enrollment selfsigned
53      subject-name cn=IOS-Self-Signed-Certificate-802439168
54      revocation-check none
55      rsa-keypair TP-self-signed-802439168
56  !
57  !
58  crypto pki certificate chain TP-self-signed-802439168
59      certificate self-signed 01
60          3082023D 308201A6 A0030201 02020101 300D0609 2A864886 F70D0101 04050030
61          30312E30 2C060355 04031325 494F532D 53656C66 2D536967 6E65642D 43657274
62          69666963 6174652D 38303234 33393136 38301E17 0D393330 33303130 34333931
63          305A170D 32303031 30313030 30303030 5A303031 2E302C06 03550403 1325494F
64          532D5365 6C662D53 69676E65 642D4365 72746966 69636174 652D3830 32343339
65          31363830 819F300D 06092A86 4886F70D 01010105 0003818D 00308189 02818100
66          9AA9B98F 41CCCEEB 5C4D40C1 79B15141 B62D29CC DF4C1A50 645C0DB0 12FE530C
67          B7A75864 117CD82B 55B196FC 7A5F0245 EF5C9DEF 107AA59A 19F235E7 B9E879B0
68          FFEC9A80 BB1C4716 46290B09 3215925B A19F9254 F8FE1C44 91E394BC 536F7626
69          30954CBD 01B12522 9AD8BDFB 9D4F1BB3 DDA34F1C 703C2F5C B0BD9E5E 01D9CD23
70          02030100 01A36730 65300F06 03551D13 0101FF04 05300301 01FF3012 0603551D
71          11040B30 09820748 515F4453 332E301F 0603551D 23041830 168014E0 7465A734
72          D841B9DA 9031A687 77121B5B D3CB4D30 1D060355 1D0E0416 0414E074 65A734D8
73          41B9DA90 31A68777 121B5BD3 CB4D300D 06092A86 4886F70D 01010405 00038181
74          006E1C1B 5B43389D 40C1A70A DCE625B9 613DC29A D7E8FF96 CAA00071 3CFDBA11
75          2907ED48 2473DFE1 85F93637 ED4E9468 2A7D70B8 4998FA1F 8B1F3FBA 42FC454B
76          A4311370 F188DD94 C70C2B12 D183FF82 CA18C95C 5362ADB2 EAB29A82 99CD4A9C
77          F21FFE7B 8581E8DE 53517CD2 B428193D BD936ADB 9DD0147B E02773BE E2577379 26
78  quit
79  !
80  !
81  !
82  spanning-tree mode pvst
83  spanning-tree extend system-id
84  !
85  vlan internal allocation policy ascending
86  !
87  !
88  !
89  !
90  interface Loopback100
91      ip address 172.16.25.7 255.255.255.0
92      ip ospf 1 area 0
93  !
94  interface Port-channel1
95      switchport trunk encapsulation dot1q
96      switchport mode trunk
97  !
98  interface Port-channel2
99      switchport trunk encapsulation dot1q

```



```
100 | switchport mode trunk
101 | !
102 | interface Port-channel3
103 | no switchport
104 | ip address 172.16.254.22 255.255.255.252
105 | ip ospf mtu-ignore
106 | ip ospf 1 area 0
107 | !
108 | interface Port-channel4
109 | no switchport
110 | ip address 172.16.254.18 255.255.255.252
111 | ip ospf mtu-ignore
112 | ip ospf 1 area 0
113 | !
114 | interface Port-channel5
115 | switchport trunk encapsulation dot1q
116 | switchport mode trunk
117 | !
118 | interface Port-channel15
119 | switchport trunk encapsulation dot1q
120 | switchport mode trunk
121 | !
122 | interface FastEthernet0/1
123 | no switchport
124 | no ip address
125 | channel-group 3 mode on
126 | !
127 | interface FastEthernet0/2
128 | no switchport
129 | no ip address
130 | channel-group 3 mode on
131 | !
132 | interface FastEthernet0/3
133 | no switchport
134 | no ip address
135 | channel-group 3 mode on
136 | !
137 | interface FastEthernet0/4
138 | no switchport
139 | no ip address
140 | channel-group 3 mode on
141 | !
142 | interface FastEthernet0/5
143 | no switchport
144 | no ip address
145 | channel-group 4 mode on
146 | !
147 | interface FastEthernet0/6
148 | no switchport
149 | no ip address
150 | channel-group 4 mode on
151 | !
152 | interface FastEthernet0/7
153 | no switchport
154 | no ip address
155 | channel-group 4 mode on
156 | !
157 | interface FastEthernet0/8
158 | no switchport
159 | no ip address
160 | channel-group 4 mode on
161 | !
```

```
162 interface FastEthernet0/9
163 !
164 interface FastEthernet0/10
165 !
166 interface FastEthernet0/11
167 !
168 interface FastEthernet0/12
169 !
170 interface FastEthernet0/13
171   switchport trunk encapsulation dot1q
172   switchport mode trunk
173 !
174 interface FastEthernet0/14
175   switchport trunk encapsulation dot1q
176   switchport mode trunk
177 !
178 interface FastEthernet0/15
179   switchport trunk encapsulation dot1q
180   switchport mode trunk
181   channel-group 1 mode on
182 !
183 interface FastEthernet0/16
184   switchport trunk encapsulation dot1q
185   switchport mode trunk
186   channel-group 1 mode on
187 !
188 interface FastEthernet0/17
189   switchport trunk encapsulation dot1q
190   switchport mode trunk
191 !
192 interface FastEthernet0/18
193   switchport trunk encapsulation dot1q
194   switchport mode trunk
195 !
196 interface FastEthernet0/19
197   switchport trunk encapsulation dot1q
198   switchport mode trunk
199   channel-group 2 mode on
200 !
201 interface FastEthernet0/20
202   switchport trunk encapsulation dot1q
203   switchport mode trunk
204   channel-group 2 mode on
205 !
206 interface FastEthernet0/21
207   switchport trunk encapsulation dot1q
208   switchport mode trunk
209 !
210 interface FastEthernet0/22
211   switchport trunk encapsulation dot1q
212   switchport mode trunk
213   channel-group 5 mode on
214 !
215 interface FastEthernet0/23
216   switchport trunk encapsulation dot1q
217   switchport mode trunk
218   channel-group 5 mode on
219 !
220 interface FastEthernet0/24
221   switchport trunk encapsulation dot1q
222   switchport mode trunk
223 !
```

```

224 interface GigabitEthernet0/1
225 !
226 interface GigabitEthernet0/2
227 !
228 interface Vlan1
229   no ip address
230   shutdown
231 !
232 interface Vlan10
233   ip address 172.16.1.1 255.255.255.0
234   ip ospf 1 area 0
235 !
236 interface Vlan11
237   ip address 172.16.2.1 255.255.255.0
238   ip ospf 1 area 0
239 !
240 interface Vlan20
241   no ip address
242 !
243 router ospf 1
244   log-adjacency-changes
245 !
246 ip classless
247 ip http server
248 ip http secure-server
249 !
250 !
251 ip sla enable reaction-alerts
252 !
253 snmp-server community public R0
254 snmp-server community private RW
255 !
256 !
257 line con 0
258 line vty 0 4
259   password cisco
260   login
261 line vty 5 15
262   password cisco
263   login
264 !
265 end

```

A.14.2. IP Interfaces

	Interface	IP-Address	OK?	Method	Status	Protocol
1	Vlan1	unassigned	YES	manual	administratively down	down
2	Vlan10	172.16.1.1	YES	manual	down	down
3	Vlan11	172.16.2.1	YES	manual	down	down
4	Vlan20	unassigned	YES	unset	down	down
5	FastEthernet0/1	unassigned	YES	manual	up	up
6	FastEthernet0/2	unassigned	YES	manual	up	up
7	FastEthernet0/3	unassigned	YES	manual	up	up
8	FastEthernet0/4	unassigned	YES	manual	up	up
9	FastEthernet0/5	unassigned	YES	manual	up	up
10	FastEthernet0/6	unassigned	YES	manual	up	up
11	FastEthernet0/7	unassigned	YES	manual	up	up
12	FastEthernet0/8	unassigned	YES	manual	up	up
13	FastEthernet0/9	unassigned	YES	unset	down	down
14	FastEthernet0/10	unassigned	YES	unset	down	down
15						

16	FastEthernet0/11	unassigned	YES	unset	down	down
17	FastEthernet0/12	unassigned	YES	unset	down	down
18	FastEthernet0/13	unassigned	YES	unset	up	up
19	FastEthernet0/14	unassigned	YES	unset	up	up
20	FastEthernet0/15	unassigned	YES	unset	up	up
21	FastEthernet0/16	unassigned	YES	unset	up	up
22	FastEthernet0/17	unassigned	YES	unset	up	up
23	FastEthernet0/18	unassigned	YES	unset	up	up
24	FastEthernet0/19	unassigned	YES	unset	up	up
25	FastEthernet0/20	unassigned	YES	unset	up	up
26	FastEthernet0/21	unassigned	YES	unset	up	up
27	FastEthernet0/22	unassigned	YES	unset	up	up
28	FastEthernet0/23	unassigned	YES	unset	up	up
29	FastEthernet0/24	unassigned	YES	unset	up	up
30	GigabitEthernet0/1	unassigned	YES	unset	down	down
31	GigabitEthernet0/2	unassigned	YES	unset	down	down
32	Port-channel1	unassigned	YES	unset	up	up
33	Port-channel2	unassigned	YES	unset	up	up
34	Port-channel3	172.16.254.22	YES	manual	up	up
35	Port-channel4	172.16.254.18	YES	manual	up	up
36	Port-channel5	unassigned	YES	unset	up	up
37	Port-channel15	unassigned	YES	unset	down	down
38	Loopback100	172.16.25.7	YES	manual	up	up

A.14.3. Interface Status

Port	Name	Status	Vlan	Duplex	Speed	Type
1	Fa0/1	connected	routed	a-full	a-100	10/100BaseTX
2	Fa0/2	connected	routed	a-full	a-100	10/100BaseTX
4	Fa0/3	connected	routed	a-full	a-100	10/100BaseTX
5	Fa0/4	connected	routed	a-full	a-100	10/100BaseTX
6	Fa0/5	connected	routed	a-full	a-100	10/100BaseTX
7	Fa0/6	connected	routed	a-full	a-100	10/100BaseTX
8	Fa0/7	connected	routed	a-full	a-100	10/100BaseTX
9	Fa0/8	connected	routed	a-full	a-100	10/100BaseTX
10	Fa0/9	notconnect	1	auto	auto	10/100BaseTX
11	Fa0/10	notconnect	1	auto	auto	10/100BaseTX
12	Fa0/11	notconnect	1	auto	auto	10/100BaseTX
13	Fa0/12	notconnect	1	auto	auto	10/100BaseTX
14	Fa0/13	connected	trunk	a-full	a-100	10/100BaseTX
15	Fa0/14	connected	trunk	a-full	a-100	10/100BaseTX
16	Fa0/15	connected	trunk	a-full	a-100	10/100BaseTX
17	Fa0/16	connected	trunk	a-full	a-100	10/100BaseTX
18	Fa0/17	connected	trunk	a-full	a-100	10/100BaseTX
19	Fa0/18	connected	trunk	a-full	a-100	10/100BaseTX
20	Fa0/19	connected	trunk	a-full	a-100	10/100BaseTX
21	Fa0/20	connected	trunk	a-full	a-100	10/100BaseTX
22	Fa0/21	connected	trunk	a-full	a-100	10/100BaseTX
23						
Port	Name	Status	Vlan	Duplex	Speed	Type
24	Fa0/22	connected	trunk	a-full	a-100	10/100BaseTX
25	Fa0/23	connected	trunk	a-full	a-100	10/100BaseTX
26	Fa0/24	connected	trunk	a-full	a-100	10/100BaseTX
27						
28	Gi0/1	notconnect	1	auto	auto	Not Present
29	Gi0/2	notconnect	1	auto	auto	Not Present
30	Po1	connected	trunk	a-full	a-100	
31	Po2	connected	trunk	a-full	a-100	
32	Po3	connected	routed	a-full	a-100	
33	Po4	connected	routed	a-full	a-100	
34	Po5	connected	trunk	a-full	a-100	

```
35 Po15                                notconnect unassigned auto auto
```

A.14.4. Neighbors

```
1 Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
2   S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone,
3   D - Remote, C - CVTA, M - Two-port Mac Relay
4
5 Device ID      Local Intrfce Holdtme Capability Platform Port ID
6 HQ_AS11        Fas 0/22      132          S I WS-C2960- Fas 0/2
7 HQ_AS11        Fas 0/21      132          S I WS-C2960- Fas 0/1
8 HQ_AS10        Fas 0/20      142          S I WS-C3560V Fas 0/2
9 HQ_AS10        Fas 0/19      142          S I WS-C3560V Fas 0/1
10 HQ_AS12        Fas 0/24      159          S I WS-C2960- Fas 0/2
11 HQ_AS12        Fas 0/23      159          S I WS-C2960- Fas 0/1
12 HQ_CS4         Fas 0/6       172          R S I WS-C3560- Fas 0/14
13 HQ_CS4         Fas 0/7       172          R S I WS-C3560- Fas 0/15
14 HQ_CS4         Fas 0/8       172          R S I WS-C3560- Fas 0/16
15 HQ_CS4         Fas 0/5       172          R S I WS-C3560- Fas 0/13
16 HQ_AS7         Fas 0/14      145          S I WS-C2960- Fas 0/2
17 HQ_AS7         Fas 0/13      145          S I WS-C2960- Fas 0/1
18 HQ_CS3         Fas 0/1       155          R S I WS-C3560- Fas 0/13
19 HQ_CS3         Fas 0/4       155          R S I WS-C3560- Fas 0/16
20 HQ_CS3         Fas 0/3       155          R S I WS-C3560- Fas 0/15
21 HQ_CS3         Fas 0/2       155          R S I WS-C3560- Fas 0/14
22 HQ_AS8         Fas 0/16      166          S I WS-C2960- Fas 0/2
23 HQ_AS8         Fas 0/15      166          S I WS-C2960- Fas 0/1
24 HQ_AS9         Fas 0/18      150          S I WS-C3560V Fas 0/2
25 HQ_AS9         Fas 0/17      150          S I WS-C3560V Fas 0/1
```

B. Messungen

B.1. Von X nach Y

```
1 BR2_R1#show run
2 Building configuration...
3
4
5 Current configuration : 1595 bytes
6 !
7 ! Last configuration change at 23:56:23 UTC Thu Sep 22 2016
8 version 15.1
9 service timestamps debug datetime msec
10 service timestamps log datetime msec
11 no service password-encryption
12 !
13 hostname BR2_R1
14 !
15 boot-start-marker
16 boot-end-marker
17 !
18 !
19 enable secret 5 $1$tooV$GpQ3VCxj1U3jlmnAZbnQr/
20 !
21 no aaa new-model
22 !
23 memory-size iomem 10
24 !
25 dot11 syslog
26 ip source-route
27 !
28 !
29 ip cef
30 !
31 !
32 !
33 no ipv6 cef
34 !
35 multilink bundle-name authenticated
36 !
37 !
38 !
39 !
40 !
41 !
42 !
43 !
44 !
45 !
46 !
47 voice-card 0
48 !
49 crypto pki token default removal timeout 0
50 !
51 !
52 !
53 !
54 license udi pid CISC02811 sn FCZ1432207G
55 archive
56   log config
57   hidekeys
```

```
58 | !
59 | redundancy
60 | !
61 | !
62 | !
63 | !
64 | !
65 | !
66 | !
67 | !
68 | !
69 | !
70 | interface Tunnel0
71 | ip address 172.16.255.6 255.255.255.252
72 | ip ospf 1 area 0
73 | tunnel source 200.200.200.3
74 | tunnel destination 200.200.200.1
75 | !
76 | interface FastEthernet0/0
77 | ip address 200.200.200.3 255.255.255.240
78 | duplex auto
79 | speed auto
80 | !
81 | interface FastEthernet0/1
82 | ip address 172.16.102.1 255.255.255.0
83 | ip ospf 1 area 0
84 | duplex auto
85 | speed auto
86 | !
87 | interface Serial0/0/0
88 | ip address 172.16.252.3 255.255.255.0
89 | encapsulation frame-relay
90 | ip ospf network point-to-multipoint
91 | ip ospf 1 area 0
92 | frame-relay map ip 172.16.252.1 301 broadcast
93 | frame-relay lmi-type cisco
94 | !
95 | interface Serial0/0/1
96 | no ip address
97 | shutdown
98 | clock rate 2000000
99 | !
100 | router ospf 1
101 | !
102 | ip forward-protocol nd
103 | no ip http server
104 | no ip http secure-server
105 | !
106 | !
107 | !
108 | !
109 | !
110 | !
111 | !
112 | snmp-server community public R0
113 | snmp-server community private RW
114 | !
115 | !
116 | control-plane
117 | !
118 | !
119 | !
```

```
120  !
121  mgcp profile default
122  !
123  !
124  !
125  !
126  !
127  !
128  line con 0
129  line aux 0
130  line vty 0 4
131  password ins@lab
132  login
133  transport input all
134  !
135  scheduler allocate 20000 1000
136  end
```